ORDER No.AD9903073C2

Service Manual

Portable MD Player

SJ-MJ70

Colour

(S).....Silver Type

Areas

EB.....Great Britain.

EG.....Germany and Italy, etc.

SPECIFICATIONS

Specifications

Mechanism unit:RAE1610Z Mechanism Series

■ **Audio**

System:	**MiniDisc digital audio system**
Laser:	**Semiconductor laser (=790 nm)**
Sampling frequency:	**44.1 kHz**
Coding:	**Adaptive Transform Acoustic Coding (ATRAC)**
No. of channels:	**2 (left and right, stereo)**
	1 (monaural)
Frequency response:	**20 Hz-20 kHz (+0 dB, -6dB)**
Wow and flutter:	**Below measurable limit**

■ **General**

Output Jack:	**Phones, 14 Ω**
Power output:	**6 mW+6 mW**
Power supply	
Rechargeable battery:	**DC 1.2V**
	(included rechargeable battery)
Battery:	**DC 1.5V (One LR6, AA, UM-3 battery)**
Dimensions (WxHxD)	
Cabinet dimensions:	**71.7x79.7x14.5 mm**
incl.projecting parts:	**73.3x81.3x15.3 mm**
Weight:	**94 g (with battery)**
	69 g (without battery)

■ **Play time**

(When used in hold mode, at 25°C, on a flat, stable surface)

Battery type:	**Play time**
Rechargeable:	**About 7 hours**
Panasonic alkaline:	**About 24 hours**
Both together:	**About 32 hours**

■ **Charger**

Input:	**AC 120-240 V (for Continental Europe)/ AC230-240 V (for UK), 50 Hz 4W**
Output:	**DC 340 mA (for Continental Europe)/ DC 350 mA (for UK), 1.2 V**

Notes:

- **The play time may be less depending on the operating conditions.**
- **Specifications are subject to charge without notice. Weight and dimensions are approximate.**

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

1. Precaution of Laser Diode

CAUTION:

This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted fromthe pickup lens.
Wave length:790 nm
Maximum output radiation power from pickup: 100 μ W/VDE
Laser radiation from the pickup lens is safety level,but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjsuted.
3. Do not look at the focus lens using optical insturments.
4. Recommend no to look at pickup lens for a long time.

ACHTUNG:

Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Leserstrahlung von der
Laserinheit adgestrahlt.
Wellenlänge: 790 nm
Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE
Die Strahlungan der Lasereinheit ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinhit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht über längere Zeit in die Fokussierlines blicken.

2. Operating Instructions

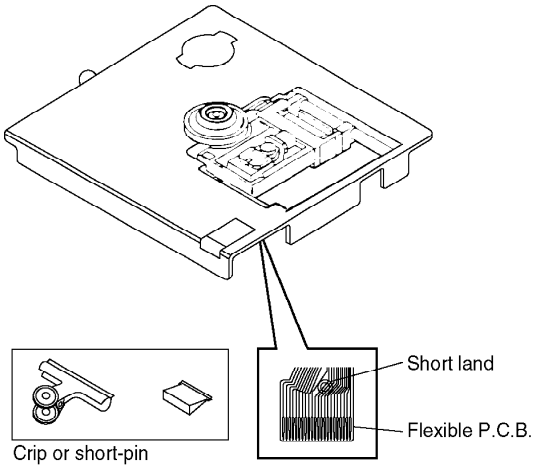
3. Handling Precautions for Traverse Deck (Mechanism Unit)

The laser diode in the mechanism unit (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.So, be careful of electrostatic breakdown during repair of the mechanism unit (optical pickup).

3.1. Mechainsm Unit (optical pickup)

1. **Do not subject the mechanism unit (optical pickup) to static electricity as it is extremely sensitive to electrical shock.**
2. **The short land between the No. 11 (GND) and No. 12 (LD) pins on the flexible board is shorted with a solder build-up to prevent damage to the laser diode. (As shown in Fig. 1.)**
   To connect to the PC board, be sure to open by removing the solder build-up, and finish the work quickly.
3. **Take care not to apply excessive stress to the flexible board (FFC).**
4. **Do not turn the variable resistor (laser power adjustment). It has already been adjusted.**

Fig. 1



3.2. Grounding for electrostatic breakdown prevention

1. Human body grounding

Use the anti-static wrist strap to discharge the static electricity from your body. (As shown in Fig. 2.)

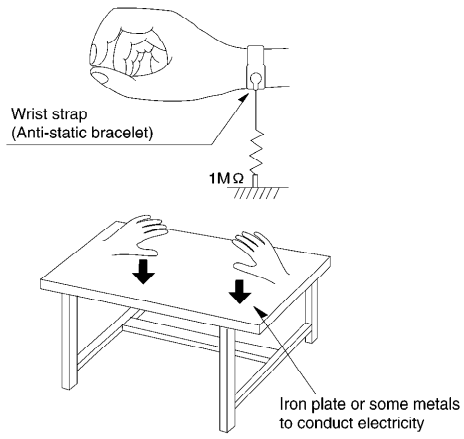
2. Work table grounding

Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).

Fig. 2



4. Operation Checks and Main Component Replacement Procedures

NOTE **1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**

2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.

3. Select item from the following index when checks or replacement are required.

• Contents

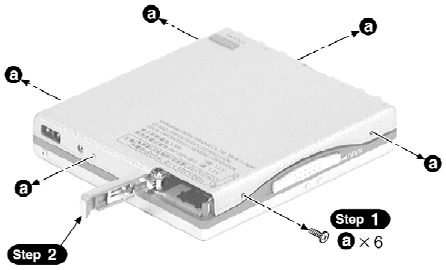
■ Checking Procedures for each P.C.B.
1. Checking for the P.C.B..

■ Main Component Replacement Procedures
1. Replacement for the intermediate cabinet.
2. Replacement for the disc cover ass'y.
3. Replacement for the traverse motor.

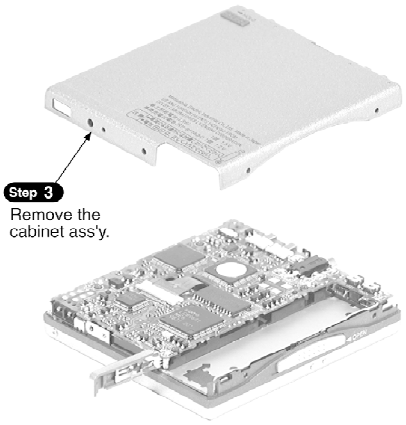
■ Checking Procedures for each P.C.B.

1. Checking for the P.C.B.

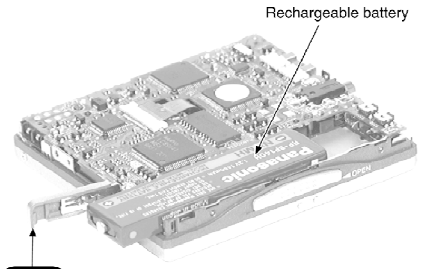
〈Checking for the P.C.B. (A side)〉



Open the battery cover.



Remove the cabinet ass'y.

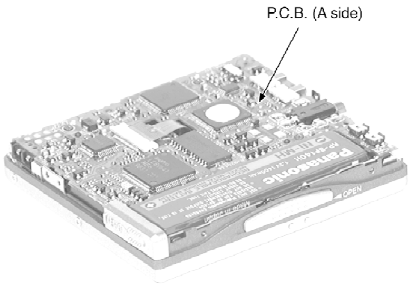


Store the rechargeable battery, and then close the battery cover.

NOTE

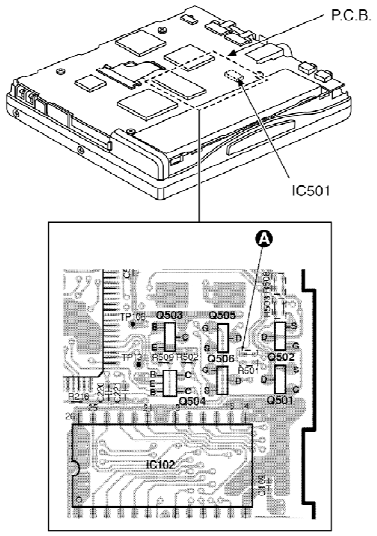
The rechargeable battery should be recharged fully.

・Check the P.C.B. (A side) as shown below.



〈Checking for the P.C.B. (B side)〉

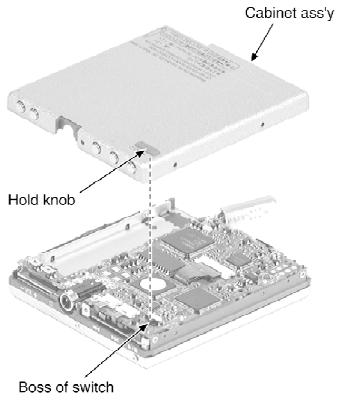
- To check the IC501 on side B of P.C.B., refer to the table 1 and illustration below



Pin No. of IC501	Check point	Pin No. of IC501	Check point
1	———	5	Same as the left side (Ⓐ) of R 501
2	Same as the drain of Q505	6	Same as the drain of Q506
3	Same as the left side (Ⓐ) of R 501	7	———
4	GND	8	Same as the collector of Q503

Notice for installation of the cabinet ass'y

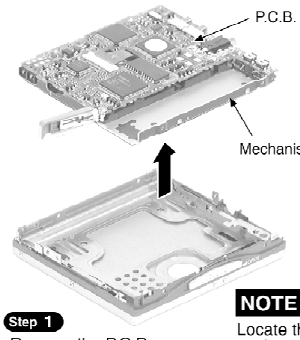
- Make sure the boss of switch are fit in the hold knob when assembling.



■ Main Component Replacement Procedures

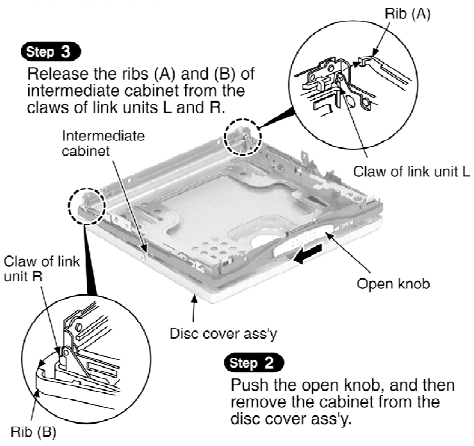
1. Replacement for the intermediate cabinet

- Follow the Step 1 ~ Step 3 of the item 1 in checking procedure for each P.C.B..



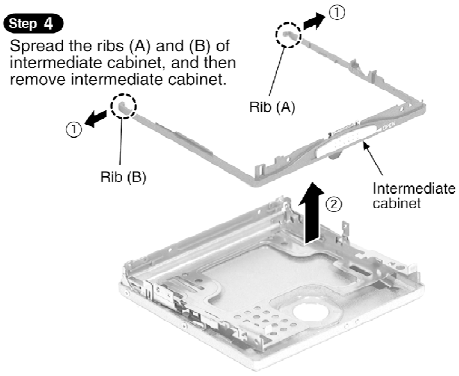
Step 1
Remove the P.C.B. and mechanism unit.

NOTE
Locate the mechanism unit as the turn table is faced up.

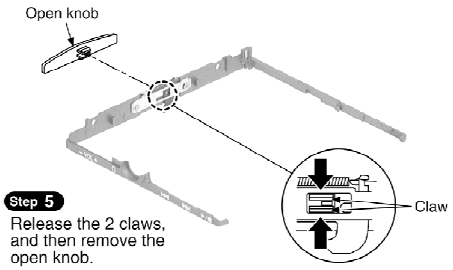


Step 3
Release the ribs (A) and (B) of intermediate cabinet from the claws of link units L and R.

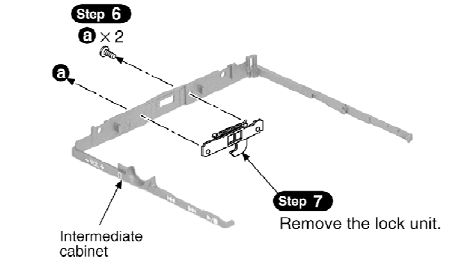
Step 2
Push the open knob, and then remove the cabinet from the disc cover ass'y.



Step 4
Spread the ribs (A) and (B) of intermediate cabinet, and then remove intermediate cabinet.



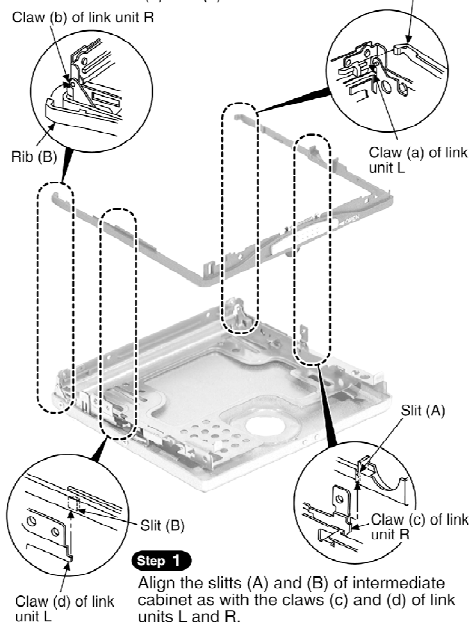
Step 5
Release the 2 claws, and then remove the open knob.



Remove the lock unit.

Installing the intermediate cabinet

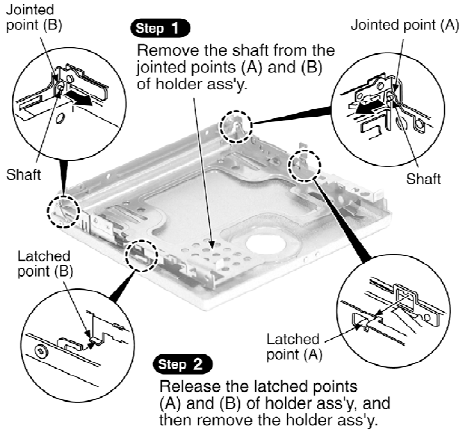
Step 2
Align the ribs (A) and (B) of intermediate cabinet as with the claws (a) and (b) of link units L and R.



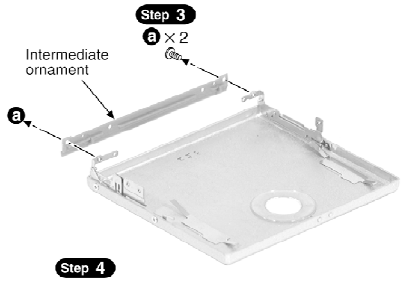
Step 1
Align the slitts (A) and (B) of intermediate cabinet as with the claws (c) and (d) of link units L and R.

2. Replacement for the disc cover ass'y

- Follow the Step 1 ~ Step 3 of the item 1 in checking procedure for each P.C.B..
- Follow the Step 1 ~ Step 4 of the item 1 in main component replacement procedures.

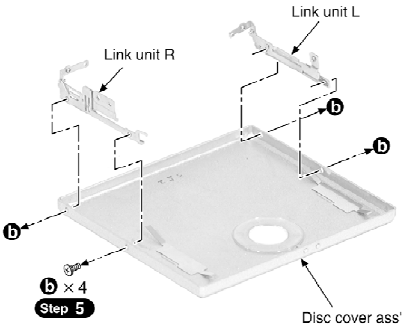


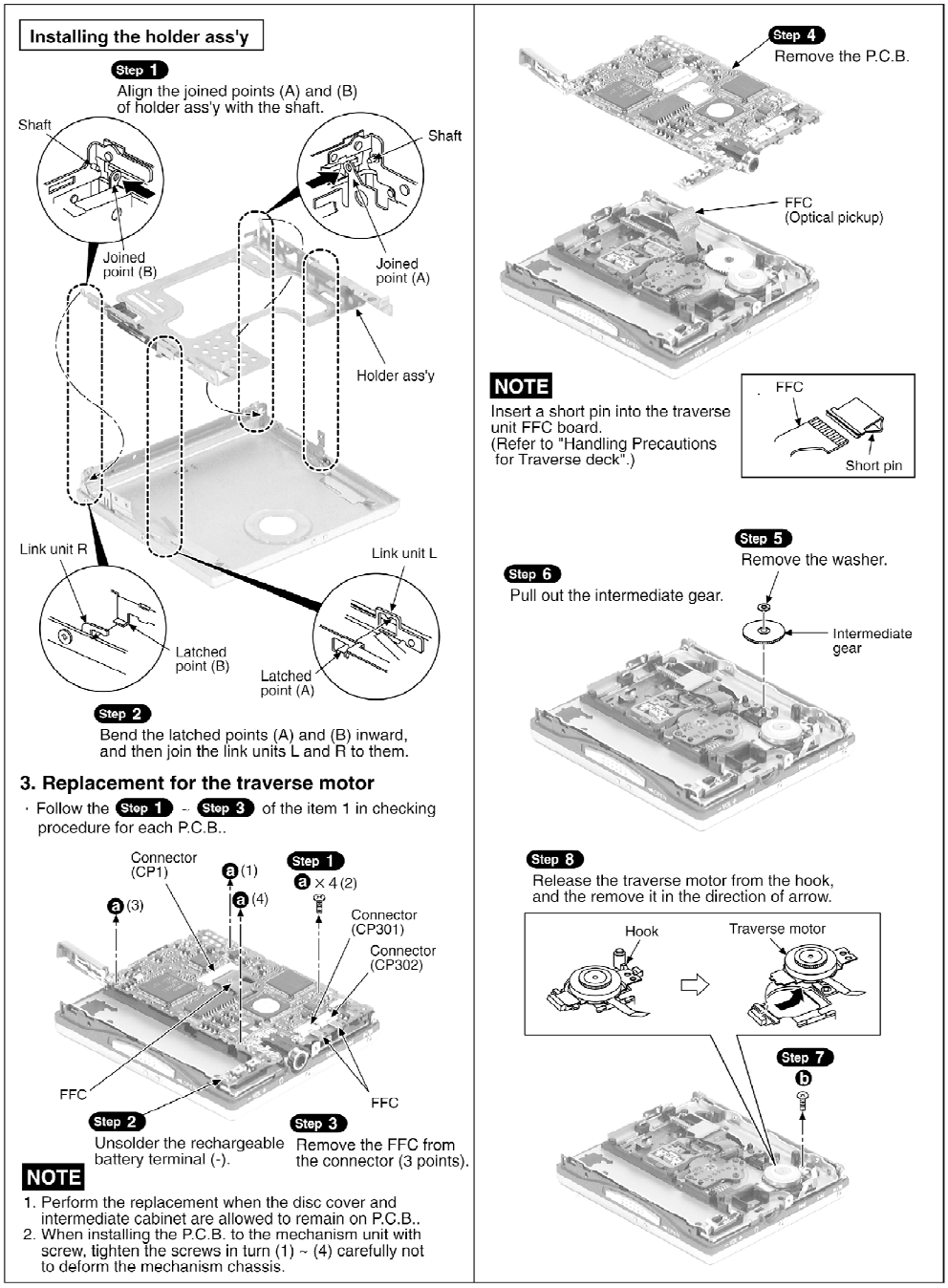
Step 2
Release the latched points (A) and (B) of holder ass'y, and then remove the holder ass'y.



Step 4
Remove the intermediate ornament.

Step 6
Remove the link units L and R.




Installing the holder ass'y
Step 1
Align the joined points (A) and (B) of holder ass'y with the shaft.
Shaft
Shaft
Joined point (B)
Joined point (A)
Holder ass'y
Link unit R
Link unit L
Latched point (B)
Latched point (A)
Step 2
Bend the latched points (A) and (B) inward, and then join the link units L and R to them.
3. Replacement for the traverse motor
· Follow the Step 1 ~ Step 3 of the item 1 in checking procedure for each P.C.B..
Connector (CP1)
a (1)
a (4)
a (3)
Step 1
a × 4 (2)
Connector (CP301)
Connector (CP302)
FFC
FFC
Step 2
Unsolder the rechargeable battery terminal (-).
Step 3
Remove the FFC from the connector (3 points).
NOTE
1. Perform the replacement when the disc cover and intermediate cabinet are allowed to remain on P.C.B..
2. When installing the P.C.B. to the mechanism unit with screw, tighten the screws in turn (1) ~ (4) carefully not to deform the mechanism chassis.
Step 4
Remove the P.C.B.
FFC (Optical pickup)
NOTE
Insert a short pin into the traverse unit FFC board.
(Refer to "Handling Precautions for Traverse deck".)
FFC
Short pin
Step 5
Remove the washer.
Step 6
Pull out the intermediate gear.
Intermediate gear
Step 8
Release the traverse motor from the hook, and the remove it in the direction of arrow.
Hook
Traverse motor
Step 7
b

5. Measurements and Adjsutments

Note:

If you exchange mechanism unit “RAE1610Z” when you repair, you must perform the automatic adjustment and checking of “playback-only disc” “magneto-optical disk” at the “adjsutment mode”.

■ **Discs to prepare**

1. Test disc (Playback-only disc)

2. Commercially available recordable disc (fully recorded with music) (magneto-optical disc)

■ **Playback-only disc/magneto-optical disc automatic adjustment**

- Preparations for adjustment

1. Check the PC board. (Refer to the item of “Checking for the P.C.B.” in “Operation Checks and Main Component Replacement Procedures”).

2. Check the laser emission.

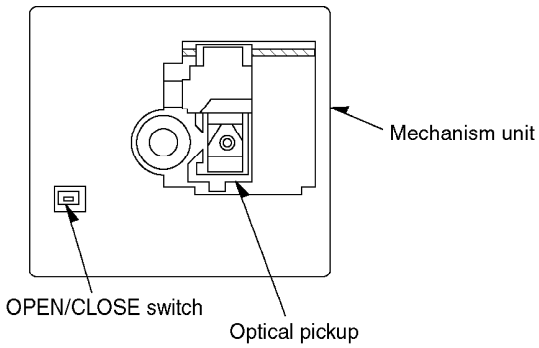
A. Make the player to the mechanism unit only. (Refer to Fig.3 or the item of “Replacement for the intermediate cabinet” in “Operation Checks and Main Component Replacement Procedures).

B. Set the battery.

C. While pressing the battery cover to connect the battery power, continuously press the OPEN/CLOSE switch. (As shown in Fig.3)

D. The optical pickup moves up and down and emits a laser. (Caution: Do not look directly at the laser light source.) If the laser does not emit a beam, follow the item of “operation check” in “Troubleshooting Guide ” and check for a malfunction.

Fig.3



3. Mount the mechanism unit on the disc cover. (Shown in the item of “Replacement for the intermediate cabinet” in “Operation Checks and Main Component Replacement Procedures”).

4. Connect the remote controller.

5. Check that the batteries are loaded, and set the test disc (TOC read).

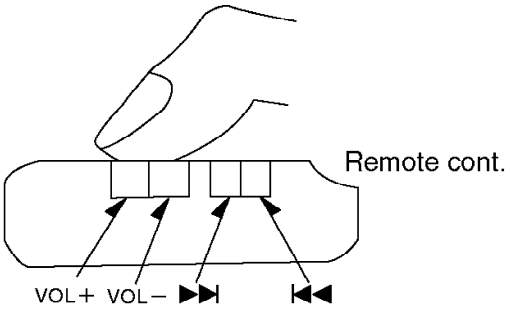
6. Turn off the power. Then, with the main unit's HOLD switch at OFF, press the VOL+, VOL-, ▶▶| , and |◀◀ buttons on the remote controller within two seconds without pressing the OFF button.

A. Using your thumb, while pressing the VOL+ button, also press the VOL- button.

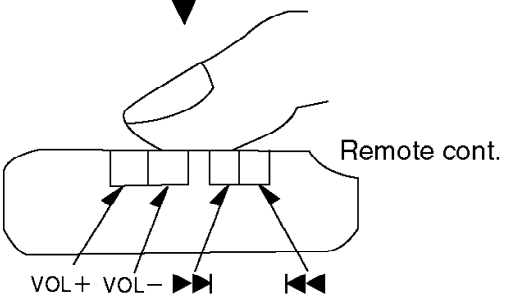
B. Then, while still pressing the VOL- button, release your thumb from the VOL+ and press the ▶▶| button.

C. While still pressing the ▶▶| button, release your thumb from the VOL- button and press the |◀◀ button. Then, while still pressing the |◀◀ button, release your thumb from the ▶▶| button and then from the |◀◀ button. (a-c are shown in Fig.4)

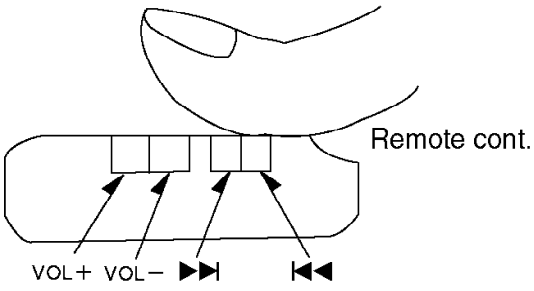
Fig.4



Using your thumb, while pressing the VOL+button, also press the VOL− button.



Then, while still pressing the VOL− button, release your thumb from the VOL+ and press the ▶▶| button.



While still pressing the ▶▶| button, release your thumb from the VOL− button and press the |◀◀ button. Then, while still presssing the |◀◀ buttom, release your thumb from the ▶▶| button and then from the |◀◀ button.

7. When the adjustment mode is activated, “TA” will be displayed. After “TA” is displayed, select the desired adjustment item with

the ▶▶| button or |◀◀ button.

Adjustment mode

Adjustment mode	Display
Playback-only disc automatic adjustment	T1
Magneto-optical disc automatic adjustment	T2
Playback-only disc automatic adjustment value check	T3
Magneto-optical disc automatic adjustment value check	T4
Laser power check	T5
EFM jitter measurement	T6
ADIP jitter measurement	T7
Error rate measurement	T8
Tilt measurement	T9
PWB inspection (audio test)	TA

***In the display of T1 ~ TA shown above, you must adjust T1 and T2.**

- Playback-only disc automatic adjustment / With the T1 displayed, press the PLAY key to active the adjustment mode. / During the adjustment, "OADJ" will be displayed. If there are no abnormalities, "OOK" will be displayed. (Note1) / If the ▶ / ■ key is pressed while the "OOK" or "ONG" is being displayed, the setting returns to the T1 display. / When finished, remove the disc. /

Note 1:
When "ONG" is displayed, follow the item of "operation check" in "Troubleshooting Guide" and check for a malfunction.

- Magneto-optical disc automatic adjustment / With the T2 displayed, set the commercially available recordable disc (which is fully recorded with music). / Press ▶ / ■ key to activate the adjustment mode. / During the adjsutment, "AADJ" will be displayed. If there are no abnormalities, "AOK" will be displayed. (Note 2) / If ▶ / ■ key is pressed while the "OOK" or "ONG" is being displayed, the setting returns to the T2 display.

When finished, remove the disc.

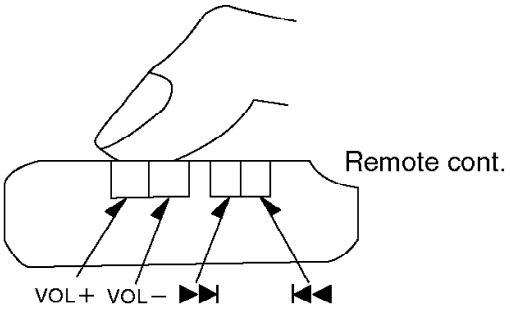
Note 2:
When “ANG” is displayed, follow the item of “operation check” in “Troubleshooting Guide” and check for a malfunction.

***To exit the adjustment mode, remove the battery.**

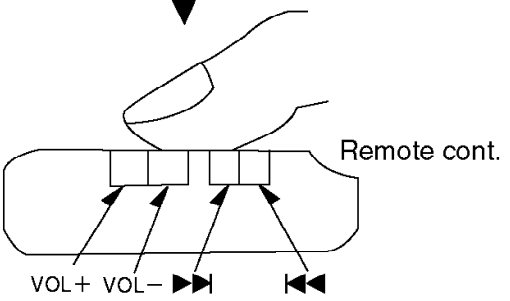
■ **Checking the main unit's keys**

1. **Check the PC board. (Refer to the item of “Check for the P.C.B.” in “Operation Checks and Main Component Replacement Procedures”).**
2. **Set the battery and connect the remote controller.**
3. **Turn off the power. Then, with the main unit’s HOLD switch at OFF, press the VOL+, VOL-, ▶▶|, and |◀◀ buttons on the remote controller within two seconds without pressing the OFF button.**
   - **A. Using your thumb, while pressing the VOL+ button, also press the VOL- button.**
   - **B. Then, while still pressing the VOL- button, release your thumb from the VOL+ and press the ▶▶| button.**
   - **C. While still pressing the ▶▶| button, release your thumb from the VOL- button and press the |◀◀ button. Then, while still pressing the |◀◀ button, release your thumb from the ▶▶| button and then from the |◀◀ button. (a-c are shown in Fig.5)**

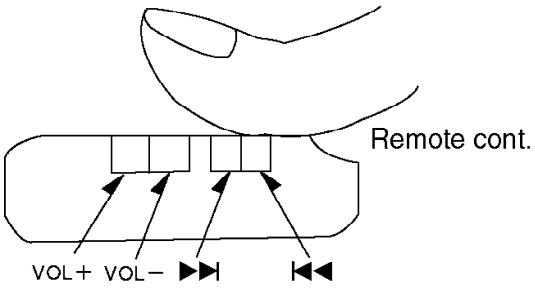
Fig.5



Using your thumb, while pressing the VOL+button, also press the VOL− button.



Then, while still pressing the VOL− button, release your thumb from the VOL+ and press the ▶▶| button.



While still pressing the ▶▶| button, release your thumb from the VOL− button and press the |◀◀ button. Then, while still presssing the |◀◀ buttom, release your thumb from the ▶▶| button and then from the |◀◀ button.

4. When entering the main unit's key check mode, "KEY" will be displayed.

With “KEY” displayed, press ▶ / ■, ▶▶|, |◀◀, VOL (+/-) keys and set the HOLD switch to OFF (no order). Then, “KEY OK” will be displayed.

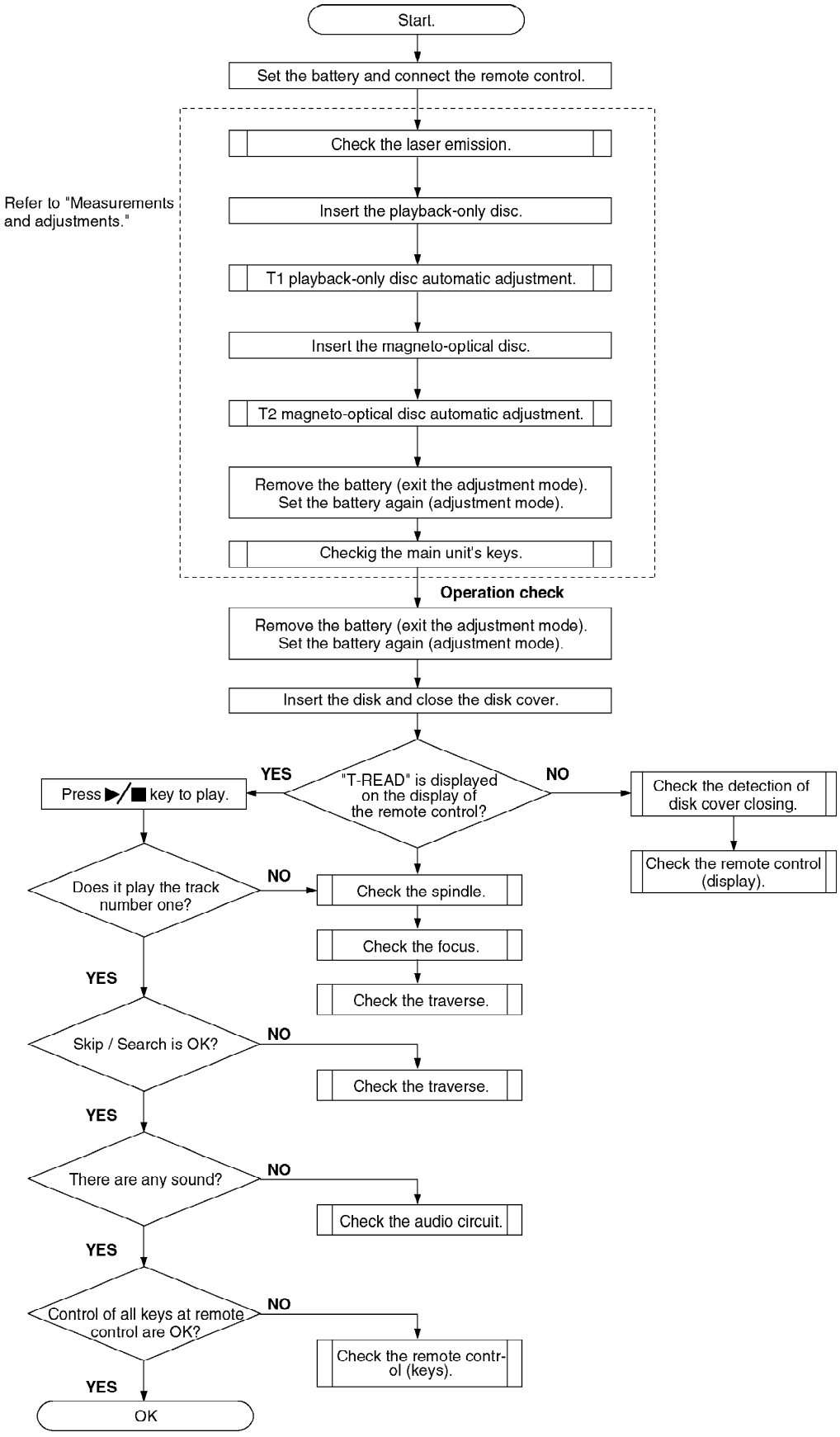
Note:
If “KEY OK” is not displayed, check the following voltage for each key.

Key	Test point	ON	OFF
▶ / ■	IC201-35 pin	0V	2.4V
HOLD	TPX110	2.4V	0V
VOL +	TP307	0V	2.4V
VOL -	TP307	0.6V	2.4V
▶▶|	TP307	1.2V	2.4V
|◀◀	TP307	1.8V	2.4V

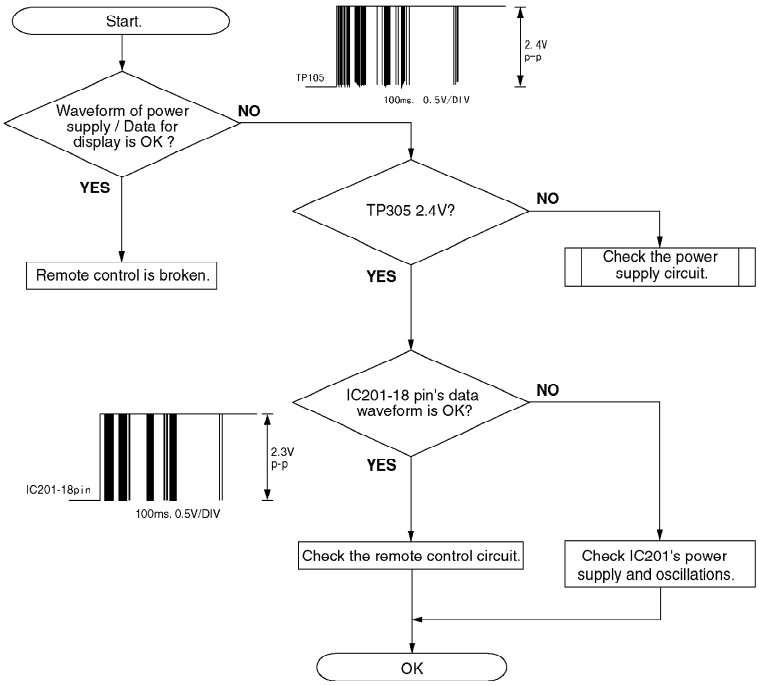
To exit the main unit’s key check mode, remove the battery.

Note:
Refer to “Printed Circuit Board and Wiring Connection Diagram” for the test points.

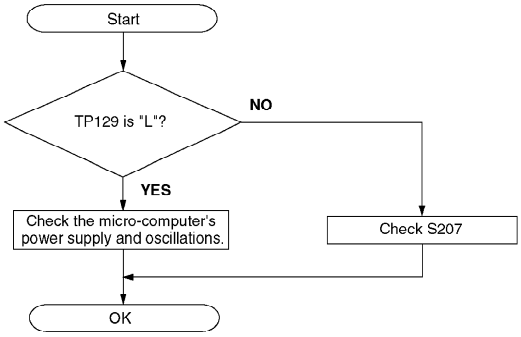
6. Troubleshooting Guide


Start.
Set the battery and connect the remote control.
Refer to "Measurements and adjustments."
Check the laser emission.
Insert the playback-only disc.
T1 playback-only disc automatic adjustment.
Insert the magneto-optical disc.
T2 magneto-optical disc automatic adjustment.
Remove the battery (exit the adjustment mode).
Set the battery again (adjustment mode).
Checkig the main unit's keys.
Operation check
Remove the battery (exit the adjustment mode).
Set the battery again (adjustment mode).
Insert the disk and close the disk cover.
"T-READ" is displayed on the display of the remote control?
YES
NO
Press ▶/■ key to play.
Check the detection of disk cover closing.
Check the remote control (display).
Does it play the track number one?
NO
YES
Check the spindle.
Check the focus.
Check the traverse.
Skip / Search is OK?
NO
YES
Check the traverse.
There are any sound?
NO
YES
Check the audio circuit.
Control of all keys at remote control are OK?
NO
YES
Check the remote control (keys).
OK

Check the remote control.

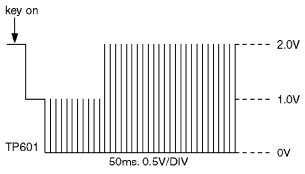


Check the detection of disk cover closing.



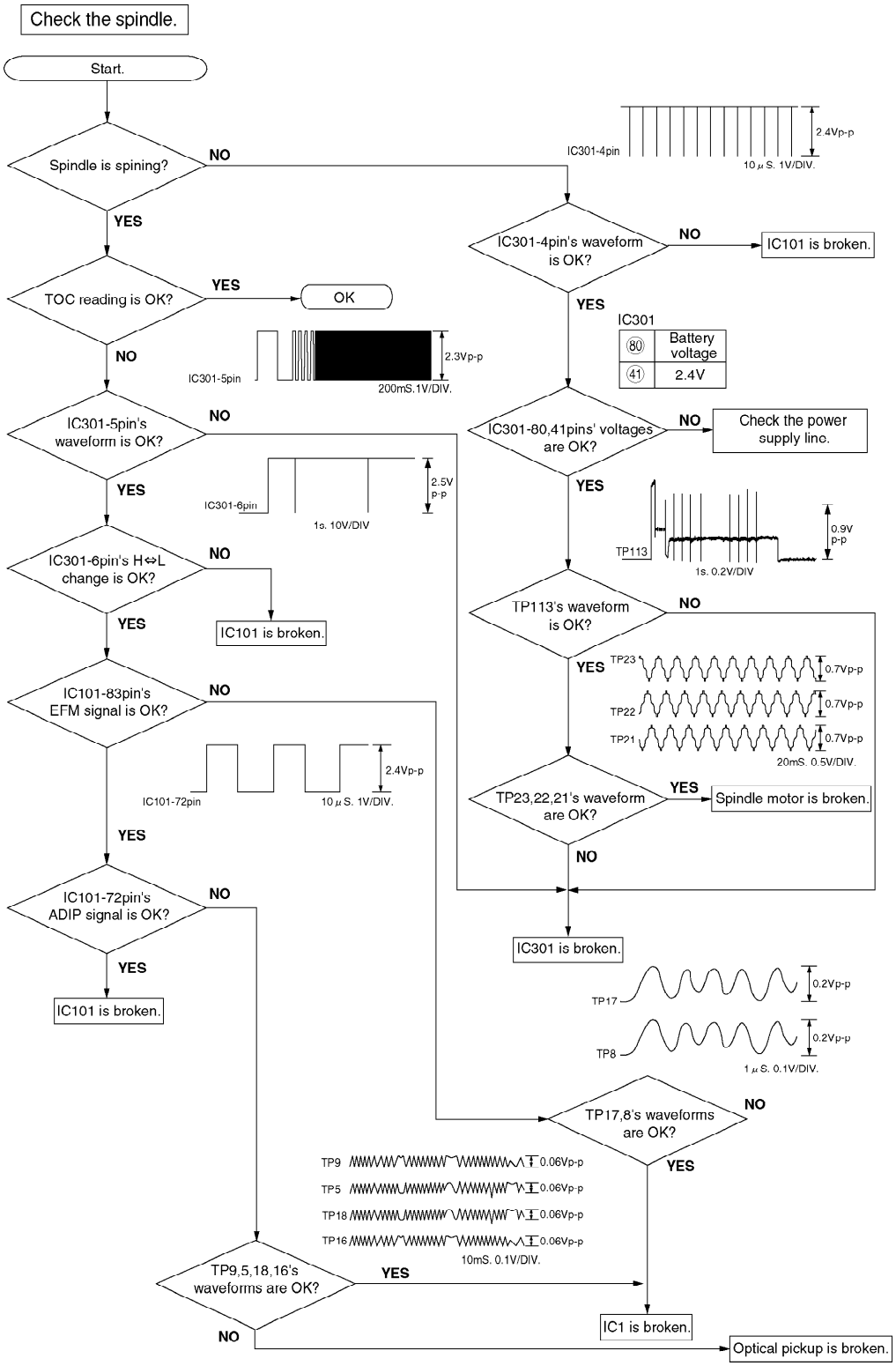
Check the remote control (keys).

○ Check TP106`s waveform and voltage when key is pressed.



MAIN	SUB	HOLD	VOLTAGE	BOUNDARY VOLTAGE
PLAY			0.15	
				0.27
VOL+			0.38	
				0.56
VOL−			0.73	
				0.85
	EQ MODE		0.96	
				1.05
	PLAY MODE		1.15	
				1.24
F-SKIP			1.34	

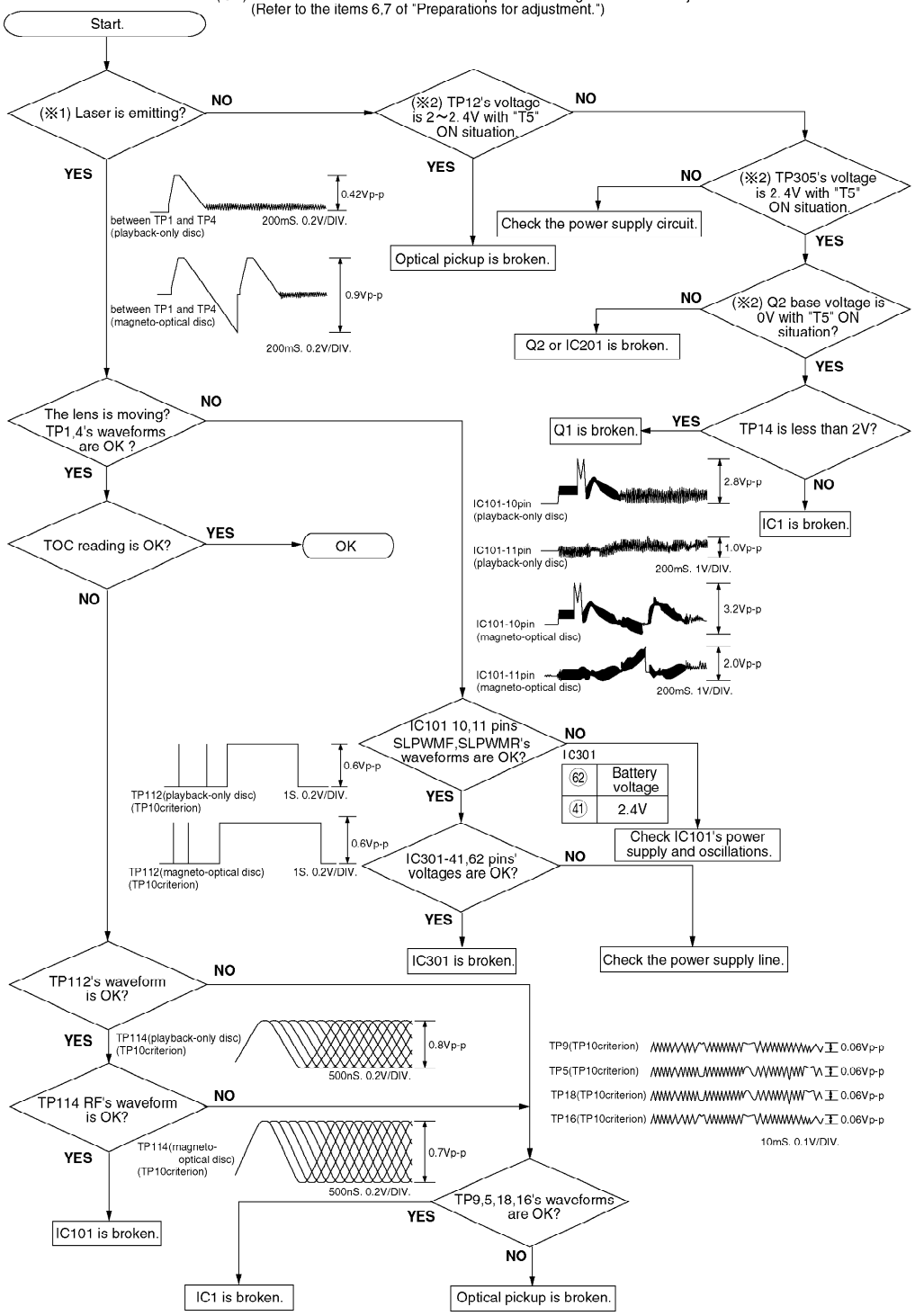
MAIN	SUB	HOLD	VOLTAGE	BOUNDARY VOLTAGE
				1.43
	DISPLAY		1.52	
				1.62
R-SKIP			1.71	
				1.75
(KEY-OFF)			2.00	
				2.12
		HOLD	2.22	
				2.31
(WITHOUT REMOTE CONT.)			2.40	

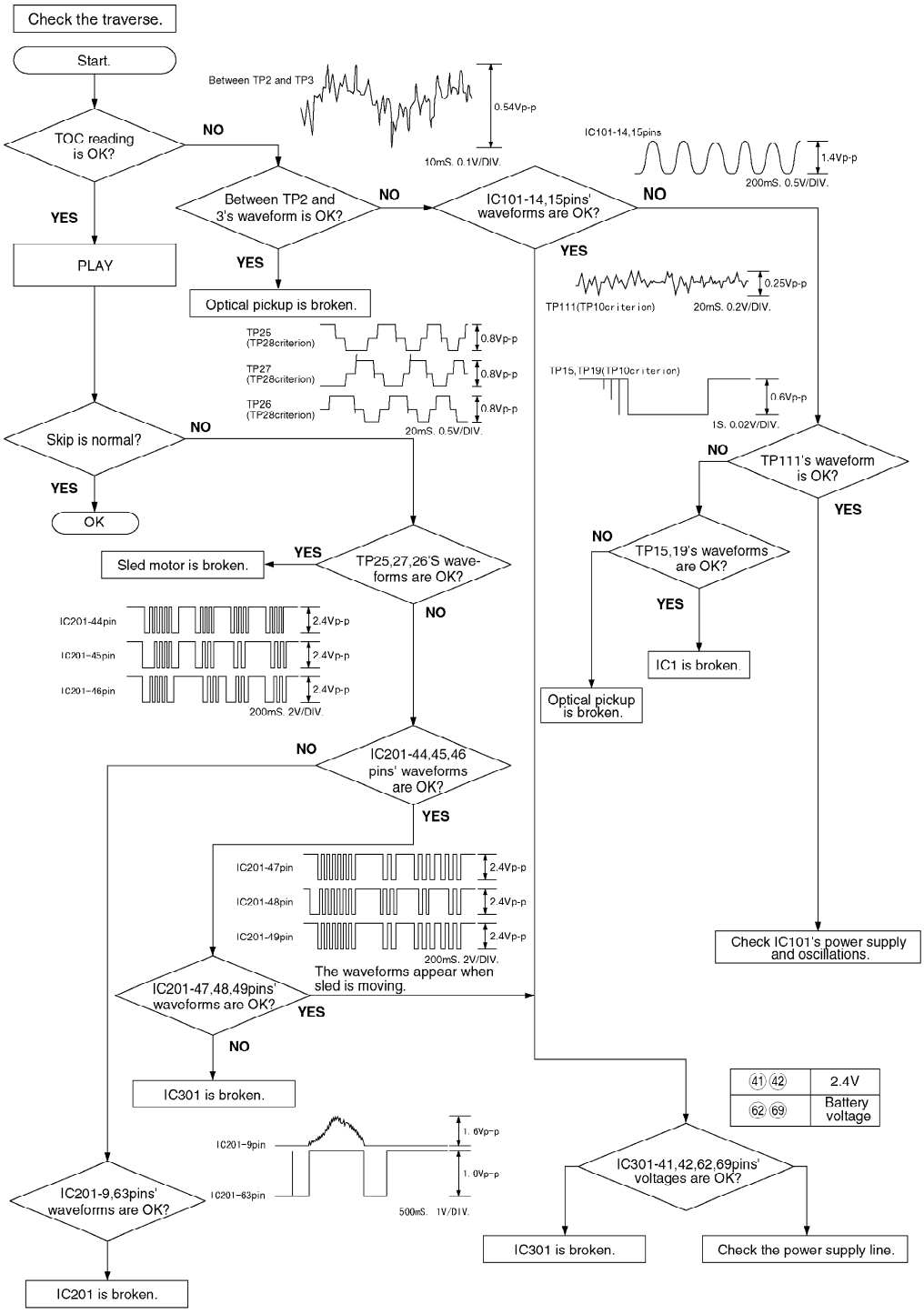

Check the spindle.
Start.
Spindle is spining?
NO
YES
TOC reading is OK?
YES
OK
NO
IC301-5pin's waveform is OK?
NO
YES
IC301-6pin's H⇔L change is OK?
NO
YES
IC101-83pin's EFM signal is OK?
NO
YES
IC101-72pin's ADIP signal is OK?
NO
YES
IC101 is broken.
IC101 is broken.
IC301-5pin
2.3Vp-p
200mS.1V/DIV.
IC301-6pin
2.5V p-p
1s. 10V/DIV
IC101-72pin
2.4Vp-p
10μS. 1V/DIV.
IC301-4pin
2.4Vp-p
10μS. 1V/DIV.
IC301-4pin's waveform is OK?
NO
IC101 is broken.
YES
IC301
80 Battery voltage
41 2.4V
IC301-80,41pins' voltages are OK?
NO
Check the power supply linc.
YES
TP113
0.9V p-p
1s. 0.2V/DIV
TP113's waveform is OK?
NO
YES
TP23
TP22
TP21
0.7Vp-p
20mS. 0.5V/DIV.
TP23,22,21's waveform are OK?
YES
Spindle motor is broken.
NO
IC301 is broken.
TP17
TP8
0.2Vp-p
1μS. 0.1V/DIV.
TP17,8's waveforms are OK?
NO
YES
TP9
TP5
TP18
TP16
0.06Vp-p
10mS. 0.1V/DIV.
TP9,5,18,16's waveforms are OK?
YES
NO
IC1 is broken.
Optical pickup is broken.

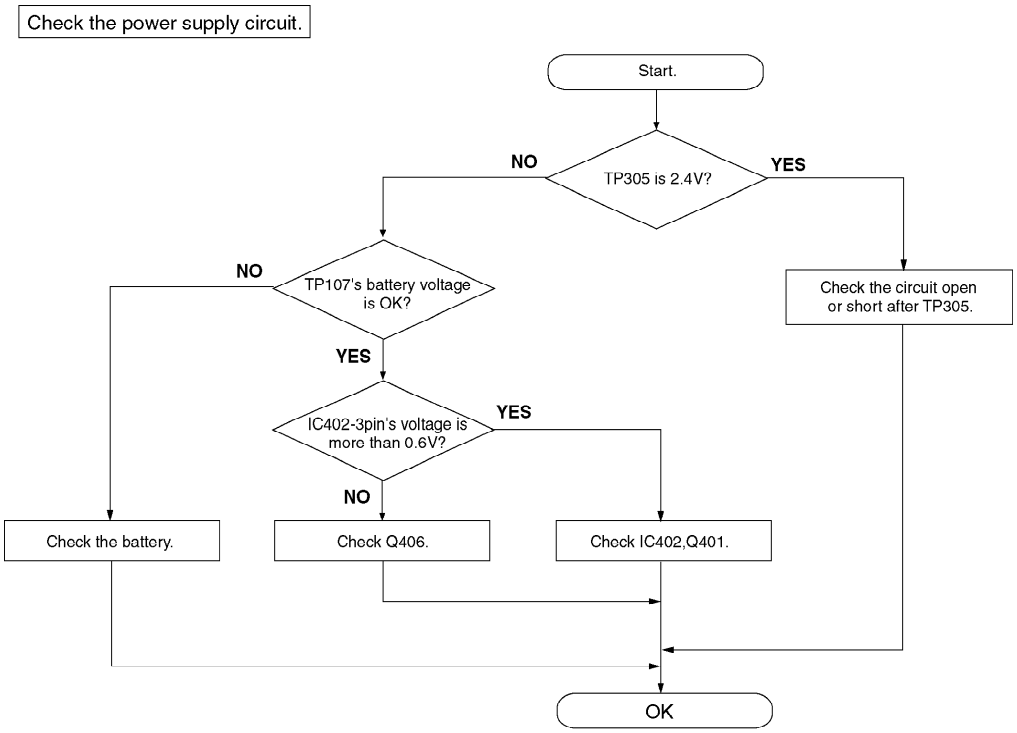
Check the focus.

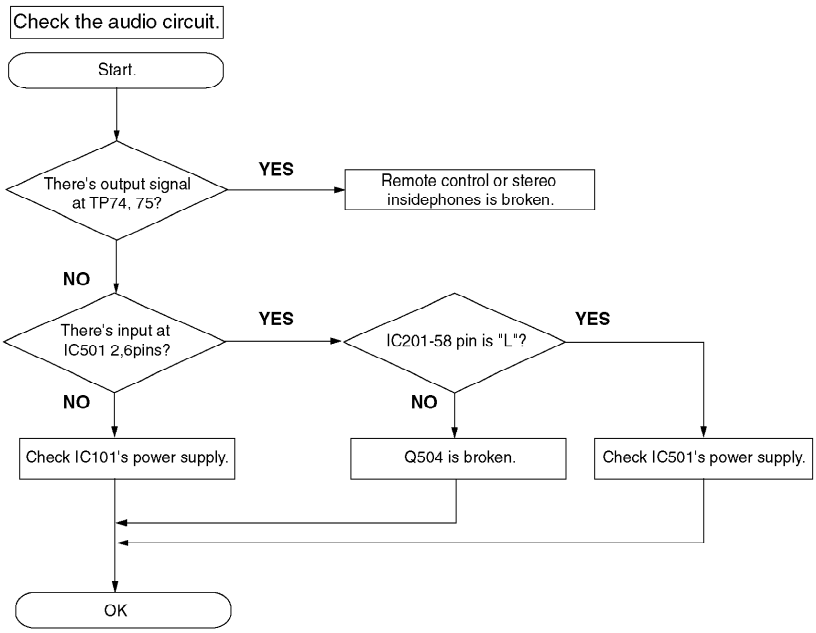
(※1) How to check the laser emission,refer to the item 2 of "Preparations for adjustment".

(※2) "T5" ON situation is to be in "LASER power checking mode" of the adjustment mode. (Refer to the items 6,7 of "Preparations for adjustment.")




Check the traverse.
Start.
TOC reading is OK?
NO
YES
PLAY
Between TP2 and TP3
0.54Vp-p
10mS. 0.1V/DIV.
Between TP2 and 3's waveform is OK?
NO
YES
Optical pickup is broken.
IC101-14,15pins' waveforms are OK?
NO
YES
IC101-14,15pins
1.4Vp-p
200mS. 0.5V/DIV.
TP111(TP10criterion)
0.25Vp-p
20mS. 0.2V/DIV.
TP25 (TP28criterion)
TP27 (TP28criterion)
TP26 (TP28criterion)
0.8Vp-p
20mS. 0.5V/DIV.
TP15, TP19(TP10criterion)
0.6Vp-p
1S. 0.02V/DIV.
Skip is normal?
NO
YES
OK
TP111's waveform is OK?
NO
YES
TP15,19's waveforms are OK?
NO
YES
IC1 is broken.
Optical pickup is broken.
Sled motor is broken.
YES
TP25,27,26'S wave-forms are OK?
NO
IC201-44pin
IC201-45pin
IC201-46pin
2.4Vp-p
200mS. 2V/DIV.
NO
IC201-44,45,46 pins' waveforms are OK?
YES
IC201-47pin
IC201-48pin
IC201-49pin
2.4Vp-p
200mS. 2V/DIV.
The waveforms appear when sled is moving.
IC201-47,48,49pins' waveforms are OK?
YES
NO
IC301 is broken.
Check IC101's power supply and oscillations.
41 42 2.4V
62 69 Battery voltage
IC201-9pin
IC201-63pin
1.6Vp-p
1.0Vp-p
500mS. 1V/DIV.
IC201-9,63pins' waveforms are OK?
IC301-41,42,62,69pins' voltages are OK?
IC201 is broken.
IC301 is broken.
Check the power supply line.





7. Schematic Diagram Notes

7.1. Schemtic Diagram Notes

This schematic diagram may be modified at any time with the development of new technology.

Notes:

- S201 : Volume (VOLUME +) switch.

- S202 : Volume (VOLUME -) switch.
- S203 : F. skip / search (▶▶|) switch.
- S204 : R. skip / search (|◀◀) switch.
- S206 : Play / stop (▶ / ■) switch.
- S207 : Cover open / close det. switch.
- S208 : Hold switch in “OFF” position.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark: MD STOP
( ): MD play [1kHz, L+R, 0dB]

Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purpose of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
Cover the parts boxes made of plastics with aluminum foil.
Ground the soldering iron.
Put a conductive mat on the work table.
Do not touch the legs of IC or LSI with the fingers directly.

Voltage and signal line
: Positive voltage line
: Playback signal

7.2. Type Illustration of IC’s, Transistors and Diodes

8. Schematic Diagram

9. Printed Circuit Board and Wiring Connection Diagram

10. Block Diagram

11. Terminal Function of IC's

11.1. IC1 (LA9606W-TFM) : RF AMP

Pin No.	Mark	I/O Division	Function
1	PPIT	O	Pit/Group discrimination input terminal ("H":pit, "L": group) (Not used, open)
2	VCC	I	Power supply terminal
3	J	I	RF signal that I-V converted input terminal
4	I		
5	F	I	Side beam signal that I-V converted input terminal
6	E		
7	D	I	Main beam signal that I-V converted input termianl
8	C		
9	B		
10	A		
11	VEE	—	GND terminal
12	NC	—	Not used, open
13	LDO	O	APC output terminal
14	NC	—	Not used, open
15	LDS	I	Laser light quantity that I-V converted input terminal
16	LDREF	I	Laser control signal input terminal
17	TBAL	I	Tracking balance control signal input terminal
18	TOFFSET	I	Tracking offset control signal input terminal
19	FOFFSET	I	Tracking offset control signal input terminal
20	AOFSET	I	ABCD offset control signal input terminal
21	SGC	I	AGC control signal input terminal

Pin No.	Mark	I/O Division	Function
22	DSW0	I	Disc mode setting input terminal (“H”:low reflection rate disc, “L”:high reflection rate disc, both DSW0 and DSW1 are “L”: laser off)
23	DSW1	I	Disc mode setting input terminal (“H”:track is pit-row, “L”:track is group, both DSWO and DSW1 are “L”:laser off)
24	NC	—	Not used, open
25	VR	I	For pass-com 1/2 VCC (reference voltage) input terminal
26	VC	O	1/2 VCC (reference voltage) output terminal
27	FE	O	Focus error signal output terminal
28	TE	O	Tracking error signal output terminal
29	ABCD	O	Main beam light quantity signal output terminal
30	HFLI	I	For making HFL signal input terminal (when group mode)
31	NC	—	Not used, open
32	BOTTOM	O	Bottom signal of RF signal output terminal
33	PEAK	O	Peak signal of RF signal output terminal
34	HFL	O	Track detection signal input terminal
35	RFVEE	—	GND terminal
36	EQ0	O	RF equalizer output terminal
37	EQI	I	RF equalizer input terminal
38	RFOI	O	RF signal output terminal
39	CHFL	O	Capacitor connection terminal for bottom hold
40	RFVCC	I	Power supply terminal
41	ADIPCR	O	ADIP carrier signal output terminal
42	NC	—	Not used, connected to GND

Pin No.	Mark	I/O Division	Function
43	WOI	I	Wobble signal input terminal
44	WDO	O	Wobble signal output terminal
45	SETR	I	Band pass filter set ting input terminal
46	CAD	I	Capaciter for DC cut of Wobble signal connect terminal
47	BWCT	I	Band pass filter select terminal for wobble signal
48	SLEEP	I	Sleep mode terminal (“H”: power supply ON, “L”: power supply OFF) (Connected to power supply through capacitor)

11.2. IC101 (LC89641) : MSP

Pin No.	Mark	I/O Division	Function
1	SGC	O	AGC control signal output terminal
2	AOFFSET	O	ABCD offset control signal output terminal
3	FOFFSET	O	Focus offset control signal output terminal
4	TOFFSET	O	Tracking offset control signal output terminal
5	TBAL	O	Tracking balance control signal output terminal
6	LDREF	O	Laser control signal output terminal
7	FG	I	Speed pulse input terminal
8	SPPWMF	O	Spindle PWM output terminal
9	SPPWMR		
10	SLPWMF	O	Sled PWM output terminal
11	SLPWMR		
12	FOPWMF	O	Focus PWM output terminal
13	FOPWMR		
14	TRPWMF	O	Tracking PWM output terminal
15	TRPWMF		
16	VSS	—	GND terminal
17	XIN	I	Crystal oscillator input terminal (f=16.9344MHz)

Pin No.	Mark	I/O Division	Function
18	XOUT	O	Crystal oscillator output terminal (f=16.9344MHz)
19	VDD2	I	Power supply terminal
20	F16M	O	16.9344MHz output terminal (Not used, open)
21	VDD1	I	Power supply terminal
22	ENH	O	Not used, open
23	LRCO	O	LR clock output terminal (Not used, open)
24	DDATA	O	Not used, open
25	BCO	O	Bit clock output terminal (Not used, open)
26	DDOUT	O	Digital audio output terminal (Not used, open)
27	AVDD2	I	Power supply terminal
28	OUTL	O	1bit DAC L channel output terminal
29	OUTR	O	1bit DAC R channel output terminal
30	AVSS	—	GND terminal
31	VDD3	I	Power supply terminal
32 ~ 35	MAD3 ~MAD0	O	Address output terminal to DRAM
36 ~ 38	MAD9 ~MAD11		
39	MRAS	O	RAS signal output terminal to DRAM
40	VSS	—	GND terminal
41	VDD1	I	Power supply terminal
42	MWE	O	WE signal output terminal to DRAM
43	MD1	I/O	Data in/output terminal to DRAM
44	MD0		
45	MD3		
46	MD2	I/O	Data in/output terminal to DRAM
47	MCAS	O	CAS signal output terimnal to DRAM
48	MOE	O	OE signal output terminal to DRAM
49 ~53	MAD8 ~MAD4	O	Addres output terminal to DRAM

Pin No.	Mark	I/O Division	Function
54	SMON3	O	Monitor signal output terminal (Not used, open)
55	SMON2	O	Monitor signal output terminal
56	SMON1	O	Monitor signal output terminal
57	SMON0	O	Monitor signal output terminal (Not used, open)
58	FSEQ	O	Not used, open
59	VP	O	CLV servo clock judgement output terminal (Not used, open)
60	FOK	O	Focus OK signal output terminal
61	DEFECT	O	Defect signal output teminal (Not used, open)
62	UCLK	O	4.2336MHz/8.4672MHz output terminal (Not used, open)
63	VDD1	I	Powe supply terminal
64	VSS	—	GND terminal
65	VDD2	I	Power supply terminal
66	CL	I	CPU interface data clock input terminal
67	CE	I	CPU interface chip enable signal input terminal
68	DI	I	CPU interface data input terminal
69	DO	O	CPU interface data output terminal
70	WRQ	O	CPU interface interrupt signal output terminal
71	INT		
72	ADIPW0	I	Wobble signal input terminal
73	RCUT	I	Input terminal for test (Connected to GND)
74	PCK	O	VCEC clock signal output terminal
75	VCVDD	I	Power supply terminal for VCEC
76	FR	I	Bias resistor terminal of VCEC osillation frequency (Connected to power supply through resistor)

Pin No.	Mark	I/O Division	Function
77	ISET	I	Bias resistor terminal of VCEC voltage charge pump (Connected to power supply through resistor)
78	VCVSS	—	GND terminal
79	PD0	O	VCEC voltage charge pump output terminal (Connected to GND through resistor and capacitor)
80	TEST3	I	Input terminal for test (Connected to power supply)
81	SLC0	O	Slice level of HF signal output terminal
82	SLCIST	I	Slice level adjustment amp. bias resistor terminal (Connected to power supply through resistor)
83	EFMIN	I	RF equalizer input terminal
84	TEST2	I	Input terminal for test (Connected to power supply)
85	VDD2	I	Power supply terminal
86	RESET	I	System reset signal input terminal
87	HFL	I	Track detection signal input terminal
88	TEST1	I	Input terminal for test (Connected to power supply)
89	VDD1	I	Power supply terminal
90	VSS	—	GND terminal
91	AVDD1	I	Power supply terminal
92	PEAK	I	Peak signal of RF signal input terminal
93	BOTTOM	I	Bottom signal of RF signal input terminal
94	ABCD	I	Main beam light quantity signal input terminal
95	TE	I	Tracking error signal input terminal
96	FE	I	Focus error signal input terminal
97	VC	I	1/2 VCC (reference voltage) input terminal
98	AVSS1	—	GND terminal

Pin No.	Mark	I/O Division	Function
99	DSW1	O	Disc mode setting output terminal (“H”:track is pit-row, “L”:track is group)
100	DSW0	O	Disc mode setting output terminal (“H”:low reflection rate disc, “L”:high reflection rate disc)

11.3. IC201 (MN101C28CAB) : SYSTEM CONTROL

Pin No.	Mark	I/O Division	Function
1	VREF-	—	Reference voltage- input terminal (Connected to GND)
2	AN0	—	Not used, connected to GND through resistor
3	BATT	I	Battery voltage detect terminal
4	KEY IN	I	Key input terminal
5	AN3	I	Area select termianl (Connected to power supply through resistor)
6	REM KEY	I	Remocon key input terminal
7	DOCTOR	I	Check mode input terminal (“L”:check mode)(Connected to power supply through resistor)
8	AN6	—	Not used, connected to GND
9	SE	I	Sled error voltage input terminal
10	VREF+	I	Reference voltage+ input terminal
11	VDD	I	Power supply terminal
12	OSC2	I	System clock input terminal (8MHz)
13	OSC1	O	System clock output terminal (8MHz)
14	VSS	—	GND terminal
15	XI	I	Sub clock input terminal (Not used, connected to GND)
16	XO	O	Sub clock output terminal (Not used, open)

Pin No.	Mark	I/O Division	Function
17	MMOD	—	Memory mode select terminal (Connected to GND)
18	REM DATA	O	LCD driver data output terminal
19	—	I	Connected to GND through resistor
20	—	—	Not used, open
21	SSDW	O	CPU interface data output terminal
22	SSDR	I	CPU interface data input terminal
23	SSCLK	O	CPU interface data clock output terminal
24	BUZZER	O	Buzzer control output terminal
25	RST	I	Reset signal input terminal
26	SELAD	O	CPU interface chip enable output terminal
27	—	—	Not used, open
28	SE TR	O	Band pass filter set terminal
29	—	—	Not used, open
30	BWCT	O	Band pass filter select output terminal
31	INTB	I	CPU interface interrupt input terminal
32	WRQB		
33	REM WUP	I	Remocon wake up interrupt input terminal
34	OPEN SW	I	Cover open/close detect terminal (“H”:open)
35	PLAY KEY	I	Play key input terminal (“L” :STOP/PLAY)
36	AGC TC	O	RF AGC select output terminal (Not used, open)
37	PC	O	Driver IC stand by output terminal
38	ZDTCL	I	Lch no signal detect input terminal (“H”:no signal)
39	FOK	I	Focus OK signal input terminal
40	ZDTCR	I	Rch no signal detect input terminal (“H”:no signal)
41	RESETB	O	System reset output terminal

Pin No.	Mark	I/O Division	Function
42	—	—	Not used, open
43			
44	UO	O	Stepping motor control output terminal
45	VO		
46	WO		
47	UI	I	Stepping motor control input terminal
48	VI		
49	WI		
50	LDON	O	Laser on output terminal (“L”:laser ON)
51	—	—	Not used, open
52	EEPDATA0	O	EEP ROM data output terminal
53	EEPCK	O	EEP ROM clock output terminal
54	EEPCS	O	EEP ROM chip select output terminal
55	EEPDATAI	I	EEP ROM data input terminal
56	—	—	Not used, open
57	HOLD	I	Hold switch input terminal (“L”:Hold switch off)
58	MUTEA	O	Analog mute A output terminal
59	MUTEB	O	Analog mute B output terminal
60	—	—	Not used, open
61	STBY2	O	4ch driver IC stand by 2 output terminal
62	RFCONT	O	RF amp power control output terminal
63	SEDIR	I	Sled error direction input terminal
64	TBALOK	O	Tracking balance adjustment output terminal (“H”:adjustment)(Not used, open)
65 ~78	—	—	Not used, open
79	ELON	O	EL display control output terminal (“L”:EL on)
80	P.CONT	O	Power control output terminal

11.4. IC301 (BD6601KVT) : FOCUS/TRACKING COIL, TRAVERSE

MOTOR DRIVE, SPINDLE MOTOR DRIVE, ROTARY DETECTOR

Pin No.	Mark	I/O Division	Function
1	S GND	—	GND terminal
2	AS GND		
3	PW IN 1	—	Not used, connected to GND
4	PW IN 2	I	Half birdge input terminal
5	FG	O	Speed pulse output terminal
6	BRK-	I	Brake comparater- input terminal
7	BRK+	I	Brake comparater+ input terminal
8	CSL2	I	Slope capacitor connect terminal
9	CSL1		
10	CST	I	Connected to capacitor
11	SP PG2	—	GND terminal
12	SP W OUT	O	Spindle motor coil (W) output terminal
13	SP VM2	I	Power supply terminal for part of spindle power
14	NC	—	Not used, open
15	SP V OUT	O	Spindle motor coil (V) output terminal
16	NC	—	Not used, open
17	SP PG1	—	GND terminal
18	NC	—	Not used, open
19	SP U OUT	O	Spindle motor coil (U) output terminal
20	SP VM1	I	Power supply terminal for part of spindle power
21	SP COM	I	Spindle motor coil center input terminal
22	SP W IN	I	Roter position detect comparater (W) input terminal
23	SP V IN	I	Roter position detect comparater (V) input terminal
24	SP U IN	I	Roter position detect comparater (U) input terminal
25	H2 PG2	—	GND terminal
26	NC	—	Not used, open

Pin No.	Mark	I/O Division	Function
27	H2 R OUT	I	H bridge 2 reverse output terminal
28	NC	—	Not used, open
29	H2 VM	I	Power supply terminal
30	NC	—	Not used, open
31	H2 F OUT	O	H bridge 2 forward output terminal
32	NC	—	Not used, open
33	H2 PG1	I	GND terminal
34	H1 PG2		
35	NC	—	Not used, open
36	H1 R OUT	O	H bridge 1 reverse output terminal
37	NC	—	Not used, open
38	H1 VM	I	Power supply terminal
39	H1 F OUT	O	H bridge 1 forward output terminal
40	H1 PG1	—	GND terminal
41	VCC1	I	Power supply terminal
42	VCC2		
43	IN 1F	I	H bridge 1 forward input terminal
44	IN 1R	I	H bridge 1 reverse input terminal
45	IN 2F		
46	IN 2R	I	H bridge 2 reverse input terminal
47	EXT CLK	I	Not used, open
48	CIP	—	Charge pump capaciter 1(+) connect terminal
49	CIM	—	Charge pump capaciter 1(-) connect terminal
50	C2P	—	Charge pump capaciter 2(+) connect terminal
51	C2M	—	Charge pump capaciter 2(-) connect terminal
52	VG	O	Charge pump output terminal
53	STALL	I	Stand by input terminal
54	STHB	I	H1, H2 bridge mute terminal
55	S1	I	Stepping decoder 1 input terminal
56	S2	I	Stepping decoder 2 input terminal
57	S3	I	Stepping decoder 3 input terminal

Pin No.	Mark	I/O Division	Function
58	BEMF U	O	Step detect comparater (U) output terminal
59	BEMF V	O	Step detect comparater (V) output terminal
60	BEMF W	O	Step detect comparater (W) output terminal
61	SL COM	I	Step motor coil center input terminal
62	SL VM1	I	Power supply terminal
63	NC	—	Not used, open
64	SL U OUT	I	Stepping motor (U) input terminal
65	SL PG1	—	GND terminal
66	NC	—	Not used, open
67	SL V OUT	I	Stepping motor (V) input terminal
68	NC	—	Not used, open
69	SL VM2	I	Power supply terminal
70	SL W OUT	O	Stepping motor (W) output terminal
71	SL PG2	—	GND terminal
72	NC	—	Not used, open
73	PW1VM	I	Power supply terminal
74	NC	—	Not used, open
75	PW1 OUT	O	Half bridge 1 output terminal
76	NC	—	Not used, open
77	PW PG	—	GND terminal
78	NC	—	Not used, open
79	PW2 OUT	O	Half bridge 2 output terminal
80	PW2 VM	I	Power supply terminal

12. Supply of Rechargeable Battery Ass'y as Replacement Parts

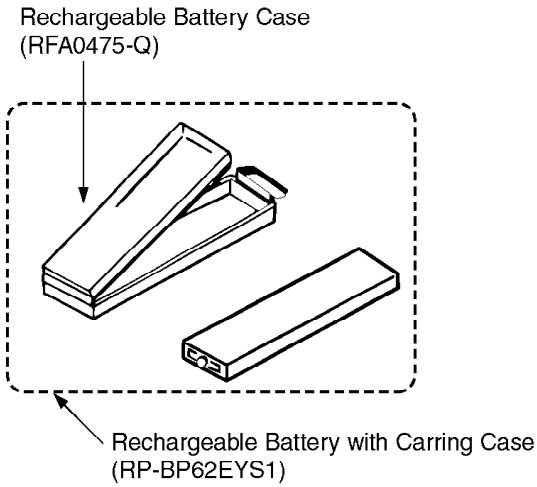
Please take note of the following points relating to Battery Carrying Case to be used for protection of Rechargeable Battery Ass'y from shorting. Replacement Parts:

- **Rechargeable Battery Ass'y (RP-BP62EYS1) supplied will be provided with Battery Carrying Case (RFA0475-Q).**
- **No replacement parts will be supplied for Rechargeable Battry Ass'y without Battery Carrying Case.**
- **Replacement parts will be supplied for Battery Carrying Case**

(RFA0475-Q) without Rechargeable Battery Ass'y.

- To your customers, delivery Rechargeable Battery Ass'y together with Battery Carrying Case to prevent shorting accidents that may occur when Rechargeable Battery Ass'y is carried about Battery Carrying Case. (as shown in Fig.6)

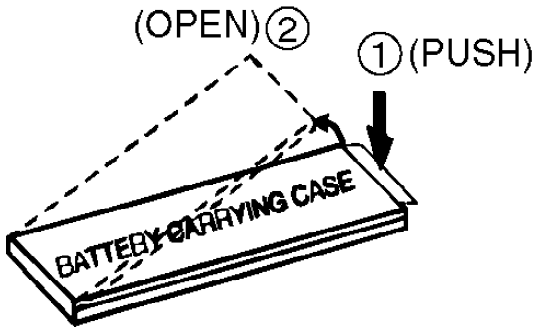
Fig.6



13. Caution in Use of Rechargeable Battery Ass'y

- Take Rechargeable Battery Ass'y out of Battery Carrying Case and use it.
- Be sure to carry Rechargeable Battery Carrying Case. If not, it may either heat or ignite by shorting with a metal. (as shown in Fig.7)

Fig.7



14. Replacement Parts List

14.1. Replacement Parts List

Notes:

***Important safety notice: / Components identified by ⚠ mark have special characteristics important for safety. / Funrthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. / When replacing any of components, be sure to use only manufacture's specified parts shown in the**

parts list. / *Warning: This product uses a laser diode. Refer to caution statements.
***ACHTUNG:Die lasereinheit nicht zerlegen.Die lasereinheit darf nur gegen einc vom hersteller spezifizierte einheit ausgetauscht werden.**
***Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F= Farads (F) / *Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M= 1,000K (OHM)**
***The marking <RTL> indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly , and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.**
***"<IA>" mark in Remarks indicate languages of instruction manual.**
[<IA> : English/Spanish/French/German/Dutch/Swedish/
Italian/Russian/Polish/Danish/Czeco]

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RGK1109-S	INTERMEDIATE	1	
2	RHQ0083-S	SCREW	6	
3	RXQ0619	LINK UNIT(L)	1	
4	RXQ0620	LINK UNIT(R)	1	
5	RXQ0621	HOLDER ASS'Y	1	
6	RYF0495Z-S	DISC COVER ASS'Y	1	
7	RYQ0253-S	INTERMEDIATE CABINET	1	
7-1	RGV0240-S	OPEN KNOB	1	
7-2	RHQ0083-S	SCREW	2	
7-3	RXQ0618-3	LOCK UNIT	1	
8	RYK0886B-S	CABINET ASS'Y	1	
8-1	RGU1703-S	OPERATION BUTTON	1	
8-2	RGU1704-S	VOLUME BUTTON	1	
8-3	RGV0241-S	HOLD KNOB	1	
9	RHQ0075-S	SCREW	6	
10	RKK0122-S	BATTERY COVER	1	
11 ⚠	RAE1610Z	MECHANISM UNIT	1	
11-1	RDG0446	INTERMEDIATE GEAR	1	
11-2	RHW11011	WASHER	1	
11-3	RMC0370	SPRING	1	
11-4	BQL1A1CWD	TRAVERSE MOTOR	1	
11-5	RHD14067	SCREW	1	
11-6	RJC99034	R.BATTERY TERMINAL(-)	1	
11-7	RMX0147	STOPPER RUBBER	1	
11-8	RHD14074	SCREW	1	
11-9	RHD14066	SCREW	1	
14	RJC99035	R.BATTERY TERMINAL(+)	1	
15	RJR0195	BATTERY SHAFT	1	
16	RHD14067	SCREW	4	
A1	RP-BP62EYS1	RECHARGEABLE BATTERY	1	
A1-1	RFA0475-Q	RECHAGEABLE BATTERY CASE	1	
A2	RFA1136-H	BATTERY CASE	1	
A3	RFC0045-K	CARRYING CASE	1	
A4	RFEV020P-SM	REMOTE CONTROL	1	
A5	RFEV325P-SA	STEREO INSIDEPHONES	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
A5-1*1	RFA0574-K	CLIP	1	
A6 ⚠	RP-BC155AEBY	CHARGER	1	(EB)
A6 ⚠	RP-BC155AEYB	CHARGER	1	(EG)
A7	RQT4975-B	INSTRUCTION MANUAL	1	<IA>
A8	RQA0117	WARRANTY CARD	1	
A9	RQCB0169	SERVICENTER LIST	1	
C1	ECUVNA105KBN	10V 1U	1	
C2	ECUE1C103KBQ	16V 0.01U	1	
C4	ECUE1H120JCQ	50V 12P	1	
C7	ECUE1H040CCQ	50V 4P	1	
C8,9	ECUVNA105KBN	10V 1U	2	
C10	ECUENJ104KBQ	6.3V 0.1U	1	
C11	RCST0EZ226RE	2.5V 22U	1	
C12	ECUENJ104KBQ	6.3V 0.1U	1	
C13	RCST0GZ156RG	4V 15U	1	
C14	ECUENJ104KBQ	6.3V 0.1U	1	
C15	RCST0GZ156RG	4V 15U	1	
C16	ECUENJ104KBQ	6.3V 0.1U	1	
C19	ECUENJ104KBQ	6.3V 0.1U	1	
C20	ECUE1H332KBQ	50V 3300P	1	
C21	ECUE1C103KBQ	16V 0.01U	1	
C22	ECUV1C823KBV	16V 0.082U	1	
C23	ECUE1H332KBQ	50V 3300P	1	
C24	ECUENJ104KBQ	6.3V 0.1U	1	
C25	RCST0GZ156RG	4V 15U	1	
C27-29	ECUE1H102KBQ	50V 1000P	3	
C101	RCST0EZ226RE	2.5V 22U	1	
C102	ECUENJ104KBQ	6.3V 0.1U	1	
C104	RCST0EZ226RE	2.5V 22U	1	
C107-14	ECUENJ104KBQ	6.3V 0.1U	8	
C115	ECUE1C103KBQ	16V 0.01U	1	
C116-23	ECUENJ104KBQ	6.3V 0.1U	8	
C124	ECUENA473KBQ	10V 0.047U	1	
C125	ECUE1C103KBQ	16V 0.01U	1	
C126	ECUENJ104KBQ	6.3V 0.1U	1	
C127	ECUE1C223KBQ	16V 0.022U	1	
C128	ECUENJ104KBQ	6.3V 0.1U	1	
C137,38	ECUENJ104KBQ	6.3V 0.1U	2	
C201	ECUE1C103KBQ	16V 0.01U	1	
C202	ECUE1H101KBQ	50V 100P	1	
C203	RCST0GZ156RG	4V 15U	1	
C204,05	ECUENJ104KBQ	6.3V 0.1U	2	
C206	ECUE1H101KBQ	50V 100P	1	
C210	ECUE1C103KBQ	16V 0.01U	1	
C211	ECUV0J474KBV	6.3V 0.47U	1	
C212	ECUE1C103MBQ	16V 0.01U	1	
C220,21	ECUVNA224KBV	10V 0.22U	2	
C301,02	ECUE1H221KBQ	50V 220P	2	
C303	RCST0GX476RE	4V 47U	1	
C304-06	ECUENJ104KBQ	6.3V 0.1U	3	
C307	RCST0GZ156RG	4V 15U	1	
C308	ECUENJ104KBQ	6.3V 0.1U	1	
C309-11	ECUENC333KBQ	16V 0.033U	3	

[illegible]	[illegible]	[illegible]	[illegible]	

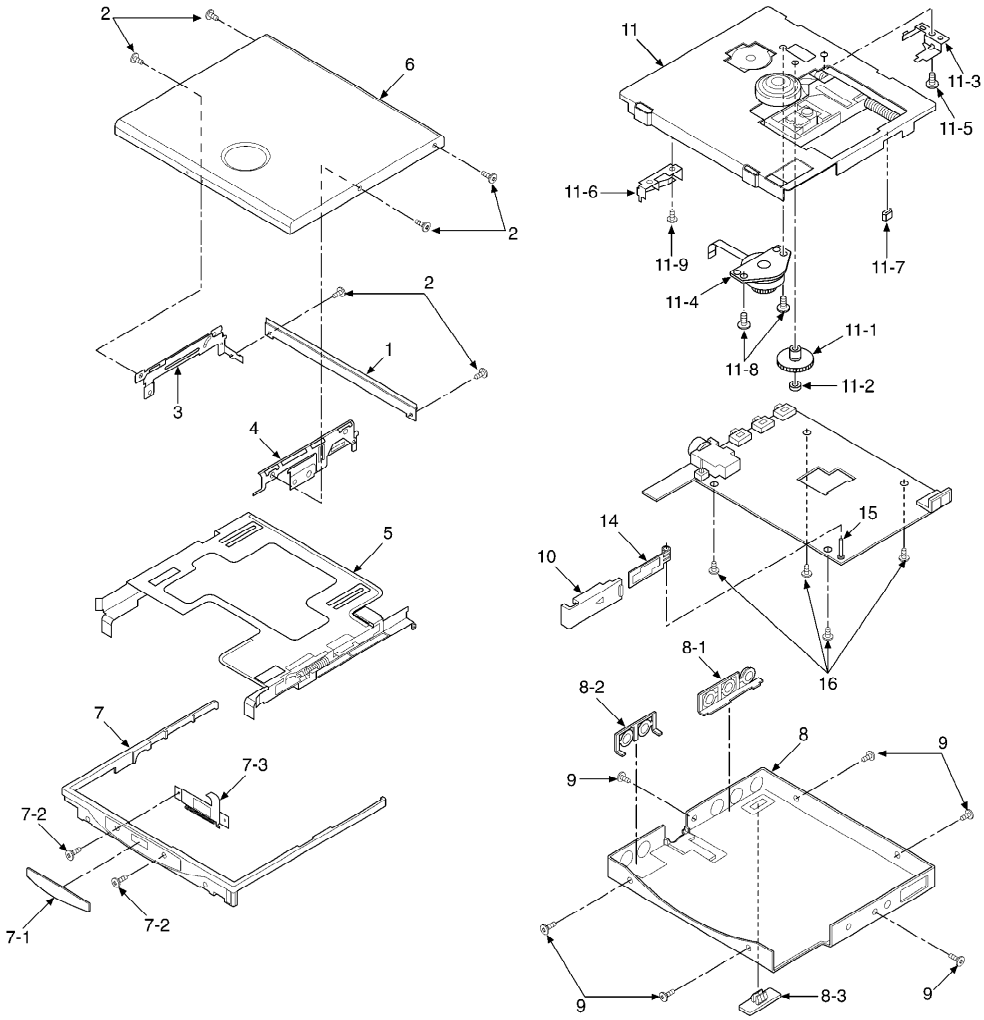
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C318	ECUVNA224KBV	10V 0.22U	1	
C319,20	ECUENC333KBQ	16V 0.033U	2	
C323-25	ECUE1H222KBQ	50V 2200P	3	
C330-33	ECUVNA105KBN	10V 1U	4	
C401	EEVMC0G221P	4V 220U	1	
C403	ECUE1H332KBQ	50V 3300P	1	
C404	EEFCD0J470R	6.3V 47U	1	
C406,07	RCST0GZ156RG	4V 15U	2	
C408	RCST0EZ226RE	2.5V 22U	1	
C410	ECUENJ104KBQ	6.3V 0.1U	1	
C501	RCST0GZ156RG	4V 15U	1	
C502	ECUENJ104KBQ	6.3V 0.1U	1	
C505,06	ECUE1H331KBQ	50V 330P	2	
C507,08	RCST0EX157RE	2.5V 150U	2	
C509	RCST0EZ226RE	2.5V 22U	1	
C510	ECUENC333KBQ	16V 0.033U	1	
C511,12	ECUVNA224KBV	10V 0.22U	2	
C513	ECUENC333KBQ	16V 0.033U	1	
CP1	RJS2A7121T	CONNECTOR(21P)	1	
CP301 02	RJS2A7104T	CONNECTOR(4P)	2	
D402	RB081L20TE25	SCHOTTKY DIODE	1	
D403	MA729TX	DIODE	1	
IC1	LA9606W-TFM	RF IC	1	
IC101	LC89641	MD DSP IC	1	
IC102	MNA7400CWA1T	16MDRAM(PBFREE)	1	
IC201	MN101CP28DAB	MICON OR MN101CP28DAB	1	
IC202	AK93C45AV-L	E2PROM	1	
IC203	XC61AC1902MR	RESET IC	1	
IC301	BD6601KVT	1CHIP DRIVER IC	1	
IC402	XC6368A241MR	D-D CONVERTER IC	1	
IC501	NJU7082BVTE1	IC	1	
JK501	RJJ36TK06-C	HEADPHONE JACK	1	
L201	ELJSC100KF2	CHIP INDUCTOR	1	
L301-04	ELJSC100KF2	CHIP INDUCTOR	4	
L305	ELJEA470KF	CHIP INDUCTOR	1	
L306	ELJSC100KF2	CHIP INDUCTOR	1	
L402	RLZ0038T-T	REFLOW CHIP COIL	1	
L403,04	ELJSC100KF2	CHIP INDUCTOR	2	
L501,02	RLBV601V-W	COIL	2	
P1	RPK1266	PACKING CASE	1	
P2	RPF0257	PROTECTION BAG	1	
P3	RPQ0575	PAD	1	
PCB1	REP2755B-M	MAIN P.C.B.	1	(RTL)
Q1	2SB1295-6-TB	TRANSISTOR	1	
Q2	DTA114YETL	TRANSISTOR	1	
Q5	XP152A12C0MR	TRANSISTOR	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
Q201	2SD1819ASTX	TRANSISTOR	1	
Q202	2SB1295-6-TB	TRANSISTOR	1	
Q401	XP161A1355PR	TRANSISTOR	1	
Q403	XP152A12C0MR	TRANSISTOR	1	
Q406	2SB1218ASTX	TRANSISTOR	1	
Q501,02	2SK2731T146	TRANSISTOR	2	
Q503	2SB1295-6-TB	TRANSISTOR	1	
Q504	UMG2NTR	TRANSISTOR	1	
Q505,06	2SK2731T146	TRANSISTOR	2	
R1	ERJ2GEJ332X	1/4W 3.3K	1	
R2	ERJ2GEJ104X	1/4W 100K	1	
R3	EXB24V113JX	1/16W 11K	1	
R4	ERJ2GEJ362X	1/4W 3.6K	1	
R5	ERJ2GEJ104X	1/4W 100K	1	
R6	ERJ2GEJ823X	1/4W 82K	1	
R7	ERJ2GEJ223X	1/4W 22K	1	
R8	ERJ2GEJ474X	1/4W 470K	1	
R20,21	ERJ2GEJ104X	1/4W 100K	2	
R24	ERJ2GEJ393X	1/4W 39K	1	
R40	ERJ2GEJ1R8X	1/4W 1.8	1	
R101	ERJ2GED683X	1/4W 68K	1	
R102	ERJ2GEJ103X	1/4W 10K	1	
R103	ERJ2GEJ184X	1/4W 180K	1	
R104	ERJ2GEJ334X	1/4W 330K	1	
R105	ERJ2GEJ683X	1/4W 68K	1	
R106	ERJ2GED113X	1/4W 11K	1	
R107	ERJ2GEJ103X	1/4W 10K	1	
R108	ERJ2GEJ224X	1/4W 220K	1	
R112	ERJ2GEJ473X	1/4W 47K	1	
R114	ERJ2GEJ474X	1/4W 470K	1	
R122	ERJ2GEJ121X	1/4W 120	1	
R125	ERJ2GEJ332X	1/4W 3.3K	1	
R126	ERJ2GEJ103X	1/4W 10K	1	
R127	ERJ2GEJ333X	1/4W 33K	1	
R128	ERJ2GEJ472X	1/4W 4.7K	1	
R130	ERJ2GED273X	1/4W 27K	1	
R131	ERJ2GEJ103X	1/4W 10K	1	
R201	EXB24V103JX	1/16W 10K	1	
R202	ERJ2GEJ473X	1/4W 47K	1	
R203	ERJ2GEJ221X	1/4W 220	1	
R204	ERJ2GEJ332X	1/4W 3.3K	1	
R205	ERJ2GEJ682X	1/4W 6.8K	1	
R206	ERJ2GEJ223X	1/4W 22K	1	
R207	ERJ2GEJ471X	1/4W 470	1	
R208	EXB28V224JX	1/32W 220K	1	
R210	ERJ2GEJ224X	1/4W 220K	1	
R214	ERJ2GEJ334X	1/4W 330K	1	
R216	ERJ2GEJ103X	1/4W 10K	1	
R217	ERJ2GEJ334X	1/4W 330K	1	
R218	ERJ2GED273X	1/4W 27K	1	
R219	EXB28V103JX	1/32W 10K	1	
R225	ERJ2GEJ223X	1/4W 22K	1	
R229	ERJ2GEJ104X	1/4W 100K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R230	EXB24V103JX	1/16W 10K	1	
R231	ERJ2GEJ104X	1/4W 100K	1	
R301	ERJ2GEJ103X	1/4W 10K	1	
R313,14	ERJ2GEJ473X	1/4W 47K	2	
R315	ERJ2GEJ103X	1/4W 10K	1	
R318	EXB24V105JX	1/16W 1M	1	
R401	ERJ2GEJ225X	1/4W 2.2M	1	
R404	ERJ2GEJ274X	1/4W 270K	1	
R405	ERJ3GEYJ105V	1/16W 1M	1	
R501	EXB24V473JX	1/16W 47K	1	
R502	ERJ2GEJ473X	1/4W 47K	1	
R503	EXB24V120JX	1/16W 12	1	
R505	EXB24V821JX	1/16W 820	1	
R507,08	EXB24V472JX	1/16W 4.7K	2	
R509	ERJ2GEJ472X	1/4W 4.7K	1	
R513,14	ERJ2GEJ153X	1/4W 15K	2	
R517	EXB28V103JX	1/32W 10K	1	
RX901	ERJ2GEJ103X	1/4W 10K	1	
S201,02	EVQPUM02K	SW,VOLUME	2	
S203,04	EVQPUL02K	SW,SKIP	2	
S206	EVQPUL02K	SW,PLAY/STOP	1	
S207	RSH1A036-A	SW,OPEN/CLOSE DET.	1	
S208	RSS2A010-1A	SW,HOLD	1	
X101	RSXY16M9F01T	OSCILLATOR	1	
X201	RSXY6M00M04T	OSCILLATOR	1	
Z401	RJH9211	CONNECTION TERMINAL	1	

Note:(*1)The clip for the inside phone is exclusively for use with the SJ-MJ70. If used with any other models, there is a possible risk of breaking the stereo inside phone code. Therefore, do not use the clip with any model other than the SJ-MJ70.

14.2. Cabinet Parts Location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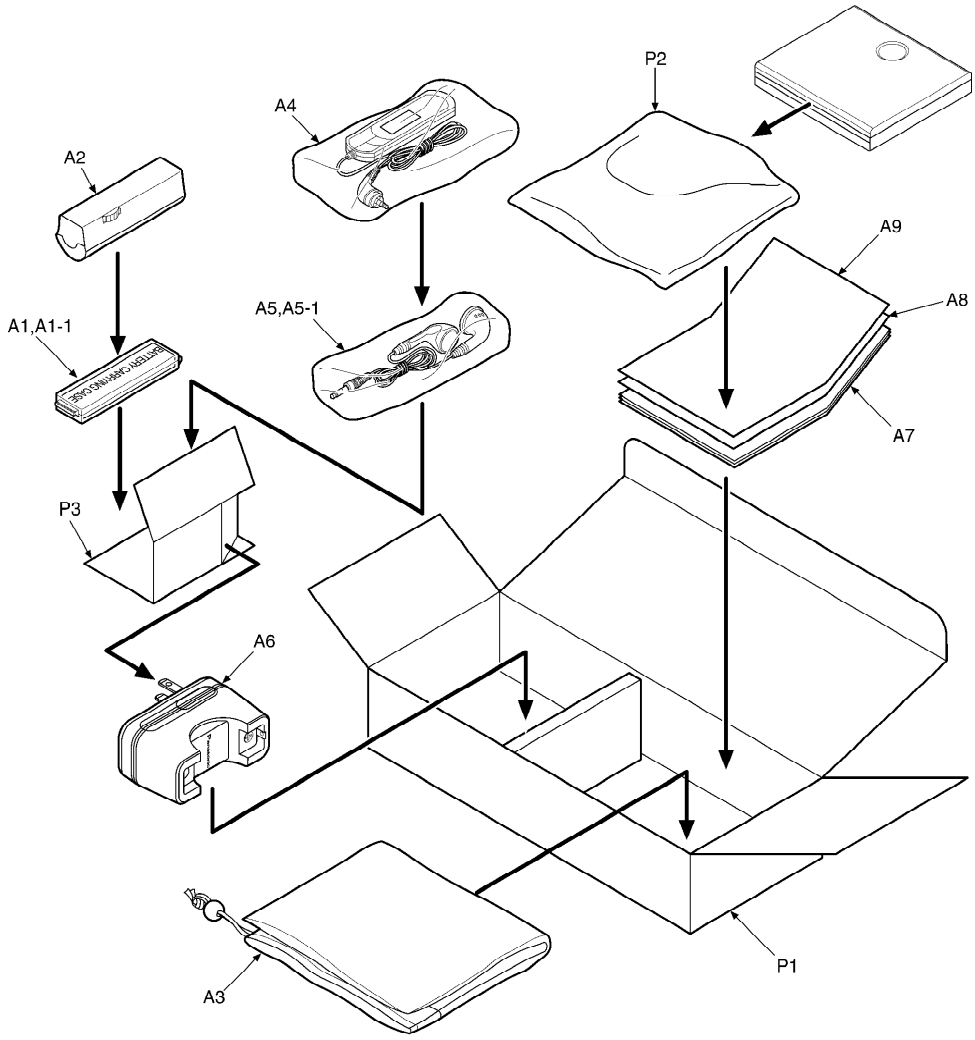
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RGK1109-S	INTERMEDIATE	1	
2	RHQ0083-S	SCREW	6	
3	RXQ0619	LINK UNIT(L)	1	
4	RXQ0620	LINK UNIT(R)	1	
5	RXQ0621	HOLDER ASS'Y	1	
6	RYF0495Z-S	DISC COVER ASS'Y	1	
7	RYQ0253-S	INTERMEDIATE CABINET	1	
7-1	RGV0240-S	OPEN KNOB	1	
7-2	RHQ0083-S	SCREW	2	
7-3	RXQ0618-3	LOCK UNIT	1	
8	RYK0886B-S	CABINET ASS'Y	1	
8-1	RGU1703-S	OPERATION BUTTON	1	
8-2	RGU1704-S	VOLUME BUTTON	1	
8-3	RGV0241-S	HOLD KNOB	1	
9	RHQ0075-S	SCREW	6	
10	RKK0122-S	BATTERY COVER	1	
11 ⚠	RAE1610Z	MECHANISM UNIT	1	
11-1	RDG0446	INTERMEDIATE GEAR	1	
11-2	RHW11011	WASHER	1	
11-3	RMC0370	SPRING	1	
11-4	BQL1A1CWD	TRAVERSE MOTOR	1	
11-5	RHD14067	SCREW	1	
11-6	RJC99034	R.BATTERY TERMINAL(-)	1	
11-7	RMX0147	STOPPER RUBBER	1	
11-8	RHD14074	SCREW	1	
11-9	RHD14066	SCREW	1	
14	RJC99035	R.BATTERY TERMINAL(+)	1	
15	RJR0195	BATTERY SHAFT	1	
16	RHD14067	SCREW	4	

14.3. Packaging

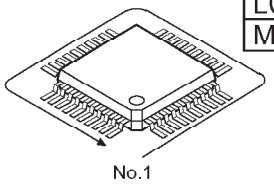
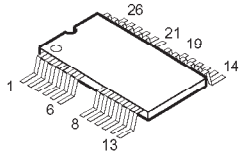
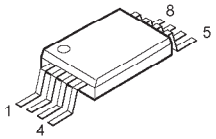
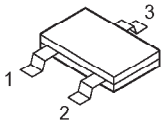
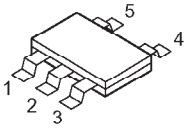
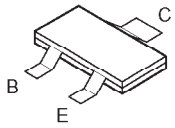
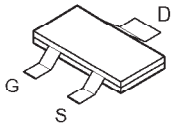
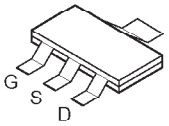
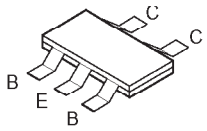
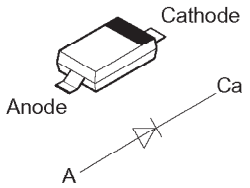
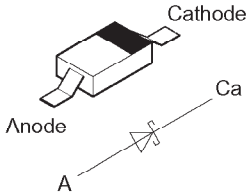


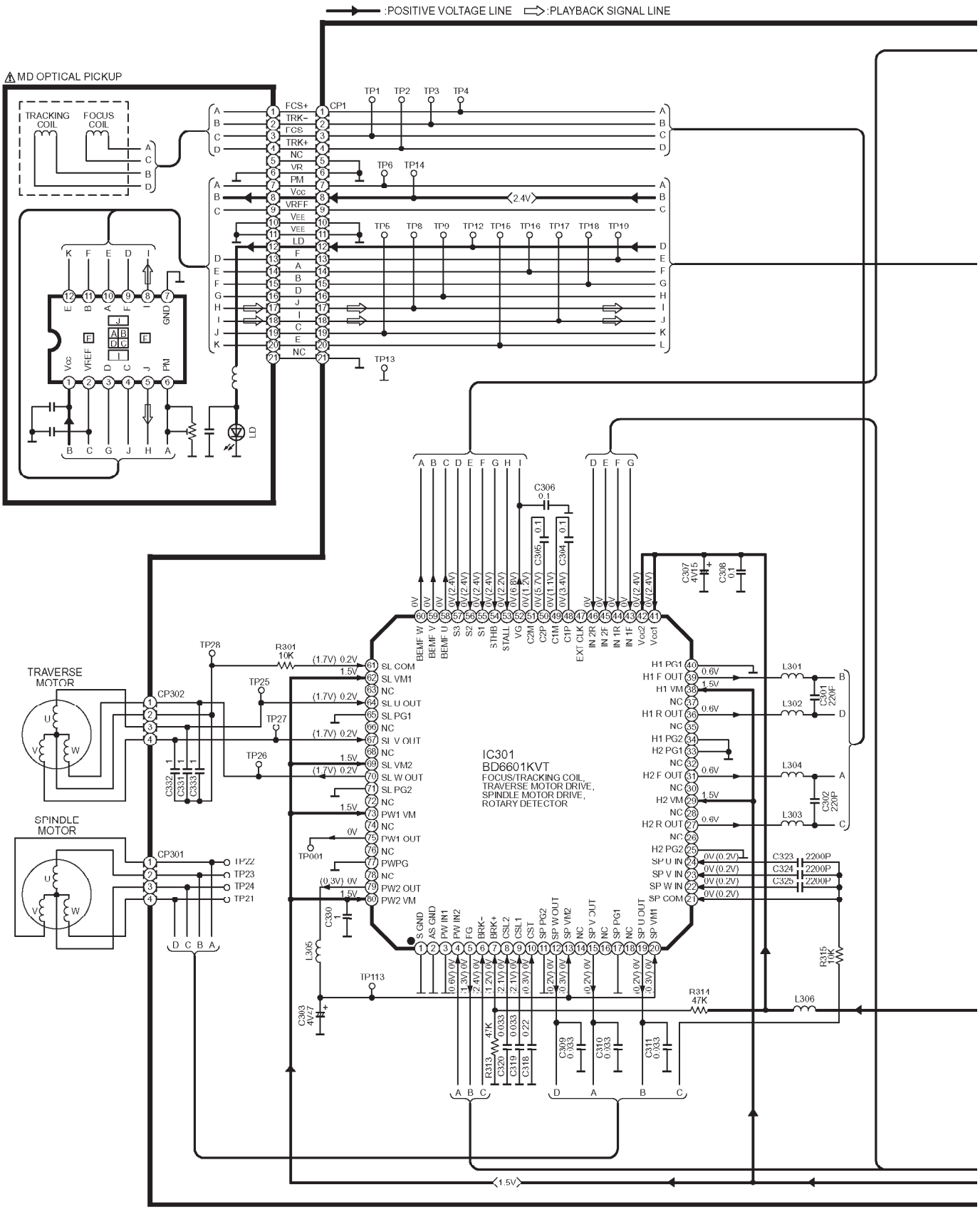
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
A1	RP-BP62EYS1	RECHARGEABLE BATTERY	1	
A1-1	RFA0475-Q	RECHAGEABLE BATTERY CASE	1	
A2	RFA1136-H	BATTERY CASE	1	
A3	RFC0045-K	CARRYING CASE	1	
A4	RFEV020P-SM	REMOTE CONTROL	1	
A5	RFEV325P-SA	STEREO INSIDEPHONES	1	
A5-1*1	RFA0574-K	CLIP	1	
A6 ⚠	RP-BC155AEBY	CHARGER	1	(EB)
A6 ⚠	RP-BC155AEYB	CHARGER	1	(EG)
A7	RQT4975-B	INSTRUCTION MANUAL	1	<IA>
A8	RQA0117	WARRANTY CARD	1	
A9	RQCB0169	SERVICENTER LIST	1	
P1	RPK1266	PACKING CASE	1	
P2	RPF0257	PROTECTION BAG	1	
P3	RPQ0575	PAD	1	

Note(*1):The clip for the inside phone is exclusively for use with the SJ-MJ70. If used with any

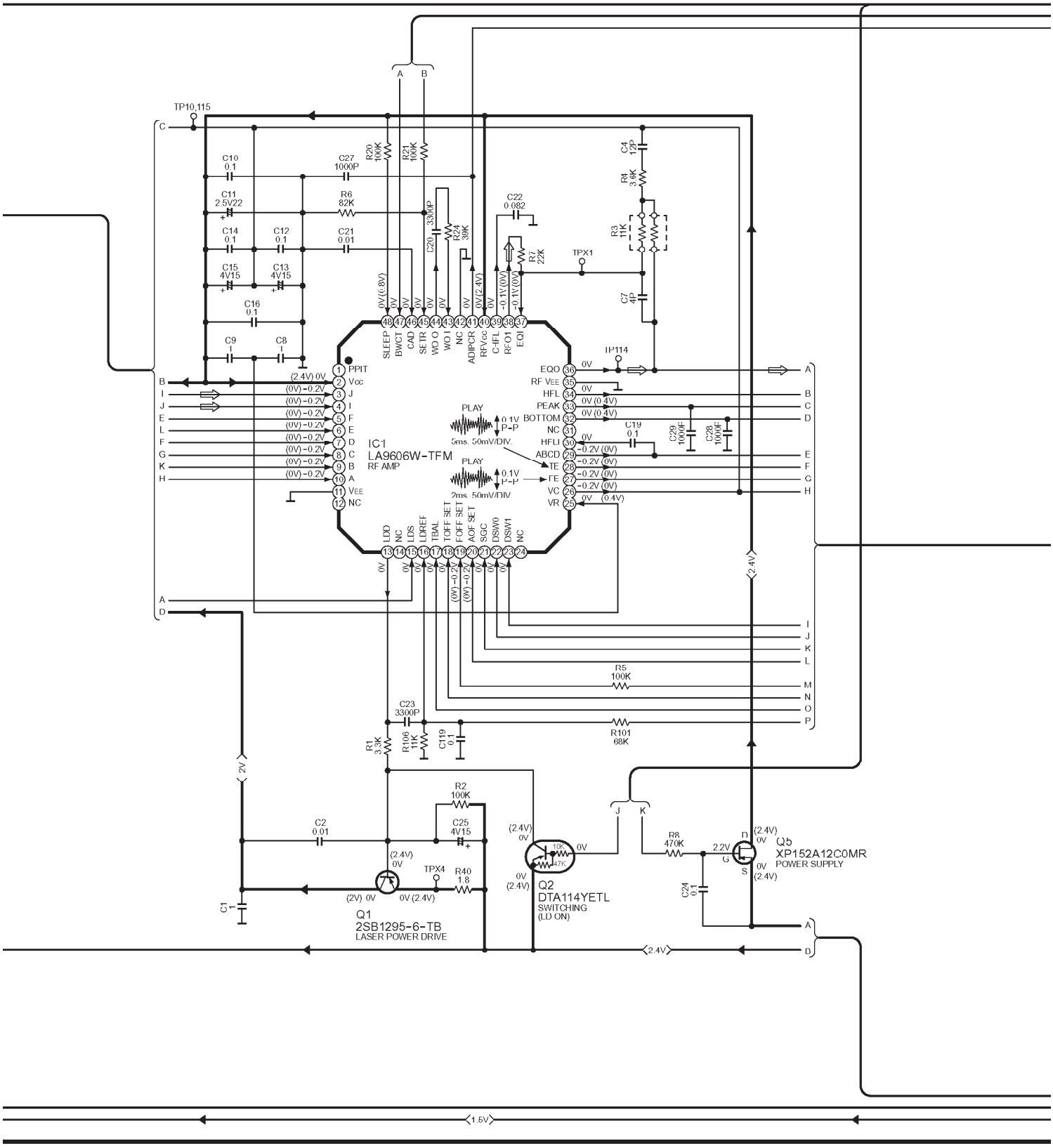
other models, there is a possible risk of breaking the stereo inside phone code. Therefore, do not use the clip with any model other than the SJ-MJ70.

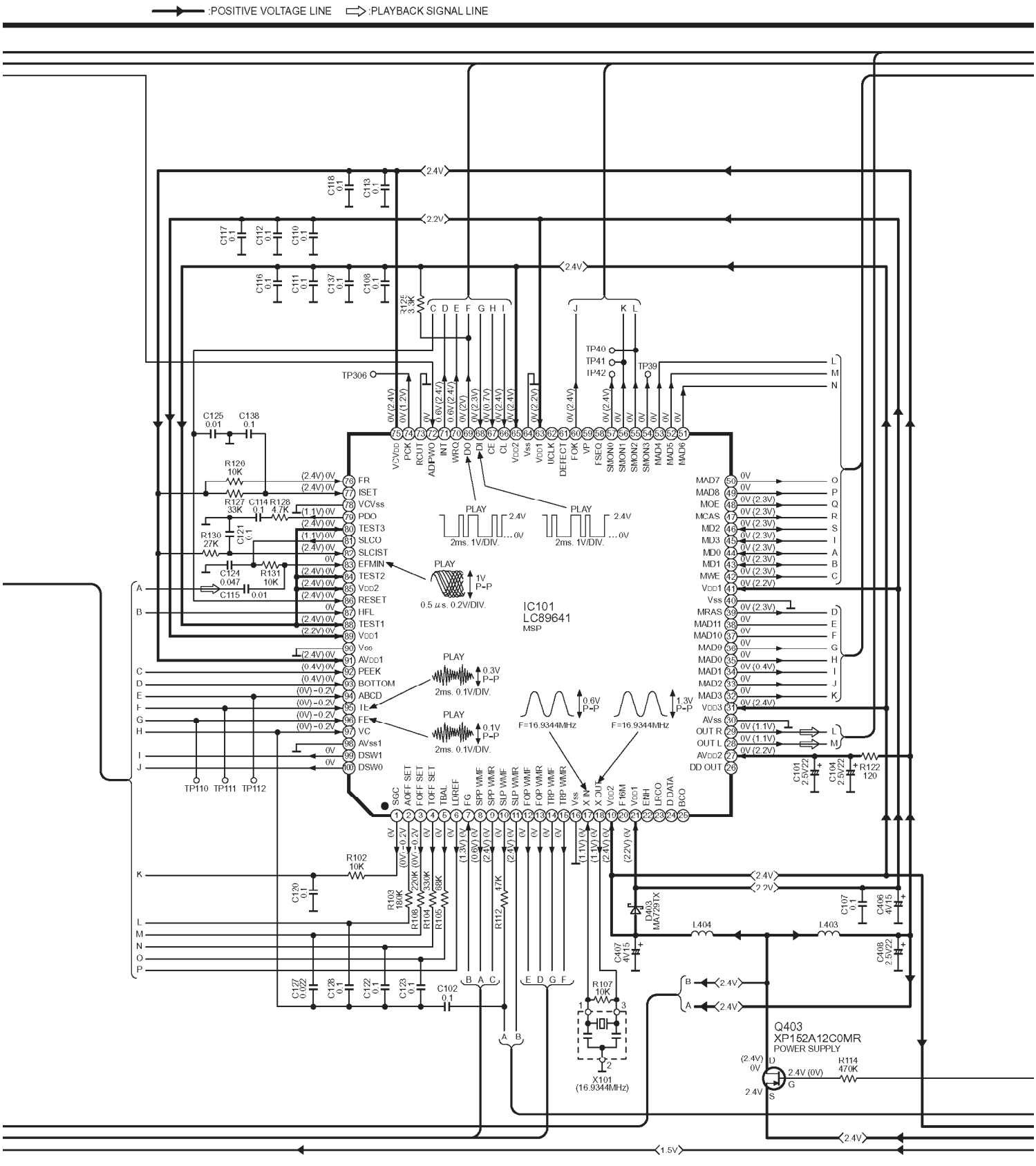
Printed in Japan (H990306000 KK/HH)

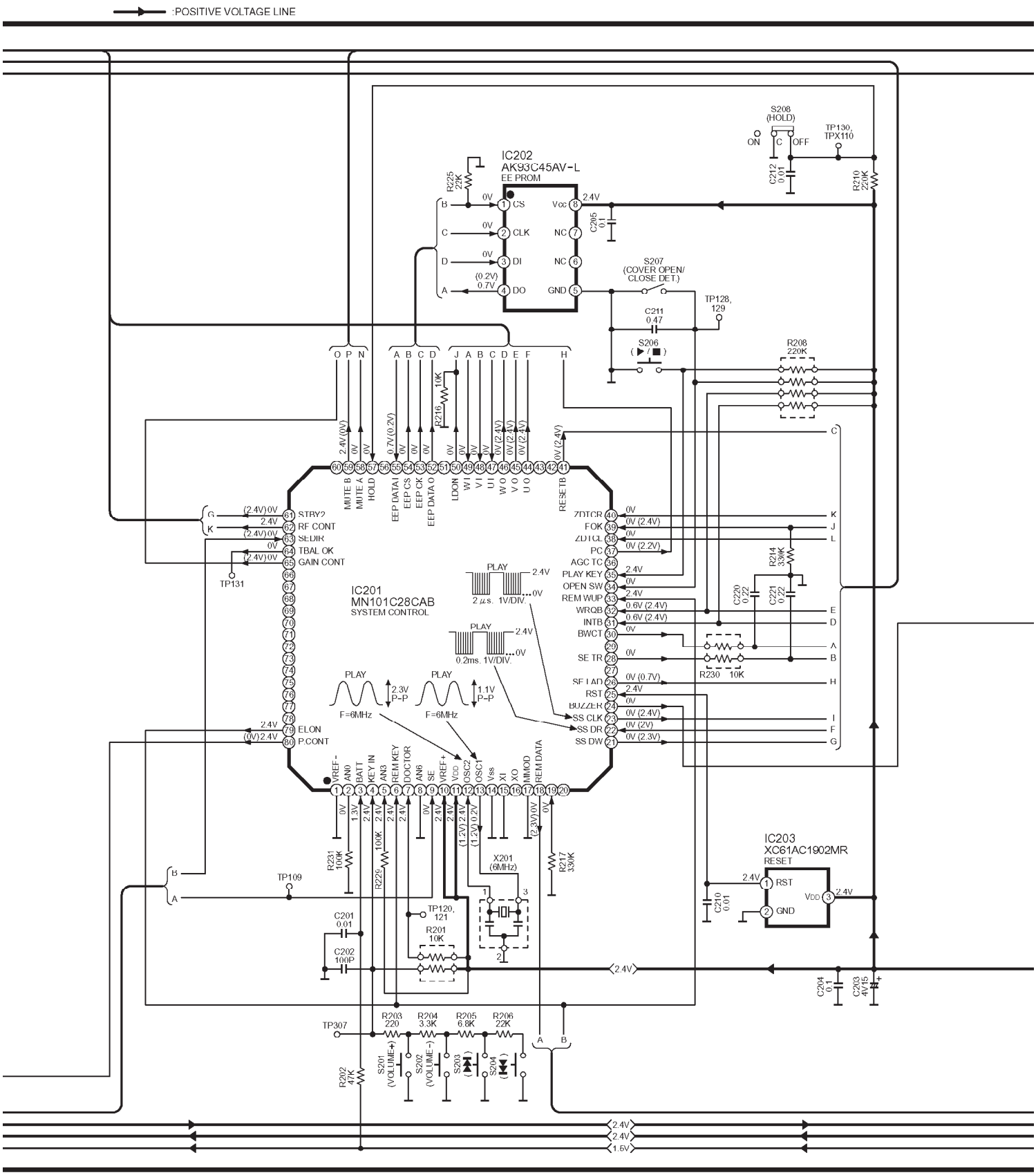
 BD6601KVT 80PIN LA9606W-TFM 48PIN LC89641 100PIN MN101C28CAB 80PIN		MNA7400CWA1T 	AK93C45AV-L NJU7082BVTE1 	XC61AC1902MR 	XC6368A241MR 
2SB1295-6-TB 2SB1218ASTX 2SD1819ASTX DTA114YETL 	XP152A12C0MR 2SK2731T146 	XP161A1355PR 	UMG2NTR 	RB081L20TE25 	MA729TX 

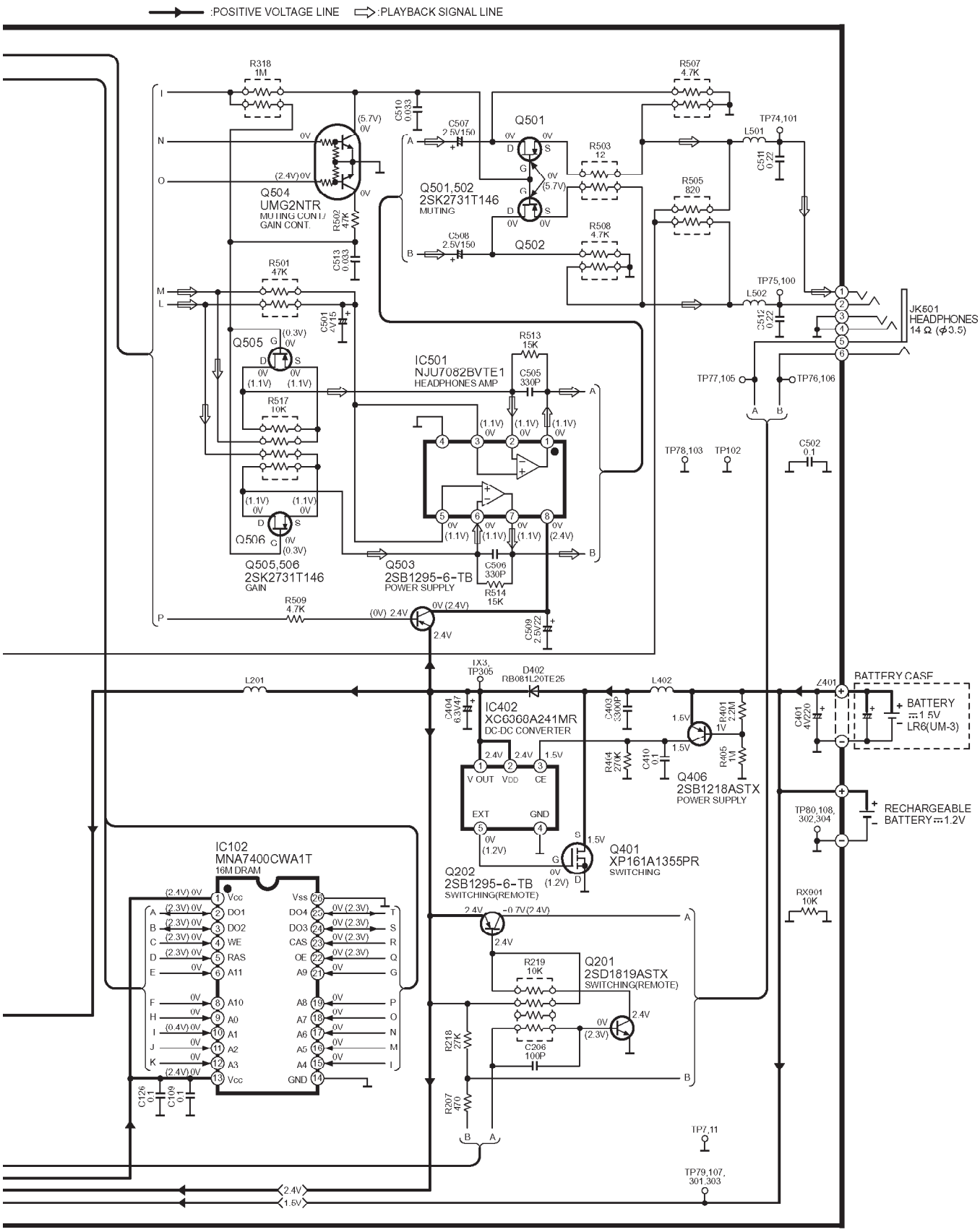

:POSITIVE VOLTAGE LINE
:PLAYBACK SIGNAL LINE
MD OPTICAL PICKUP
TRACKING COIL
FOCUS COIL
IC301
BD6601KVT
FOCUS/TRACKING COIL,
TRAVERSE MOTOR DRIVE,
SPINDLE MOTOR DRIVE,
ROTARY DETECTOR
TRAVERSE MOTOR
SPINDLE MOTOR
CP1
CP301
CP302
TP1
TP2
TP3
TP4
TP5
TP6
TP8
TP9
TP12
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP21
TP22
TP23
TP24
TP25
TP26
TP27
TP28
TP001
TP113
2.4V
1.5V
R301 10K
R311 47K
R312 47K
R313 47K
R314 47K
R315 10K
L301
L302
L303
L304
L305
L306
C301 220P
C302 220P
C303 4V47
C306 0.1
C307 4V15
C308 0.1
C309 0.033
C310 0.033
C311 0.033
C318 0.22
C319 0.033
C320 0.033
C323 2200P
C324 2200P
C325 2200P
C330 1
C331 1
C332 1
C333 1
C304 0.1
C305 0.1
SL COM
SL VM1
SL U OUT
SL PG1
SL V OUT
SL VM2
SL W OUT
SL PG2
PW1 VM
PW1 OUT
PWPG
PW2 OUT
PW2 VM
H1 PG1
H1 F OUT
H1 VM
H1 R OUT
H1 PG2
H2 PG1
H2 F OUT
H2 VM
H2 R OUT
H2 PG2
SP U IN
SP V IN
SP W IN
SP COM
S GND
AS GND
PW IN1
PW IN2
FG
BRK-
BRK+
CSL2
CSL1
CST
SP PG2
SP W OUT
SP VM2
SP V OUT
SP PG1
SP U OUT
SP VM1
BEMF W
BEMF V
BEMF U
S3
S2
S1
STHB
STALL
VG
C2M
C2P
C1M
C1P
EXT CLK
IN 2R
IN 2F
IN 1R
IN 1F
Vcc2
Vcc1

:POSITIVE VOLTAGE LINE :PLAYBACK SIGNAL LINE




:POSITIVE VOLTAGE LINE
:PLAYBACK SIGNAL LINE
IC101
LC89641
MSP
Q403
XP152A12C0MR
POWER SUPPLY
X101
(16.9344MHz)
2.4V
2.2V
1.5V


:POSITIVE VOLTAGE LINE
IC202
AK93C45AV-L
EE PROM
IC201
MN101C28CAB
SYSTEM CONTROL
IC203
XC61AC1902MR
RESET
S208
(HOLD)
S207
(COVER OPEN/
CLOSE DET.)
S206
TP128,
129
TP130,
TPX110
TP131
TP109
TP120,
121
TP307
X201
(6MHz)
R208
220K
R210
220K
R214
330K
R216
10K
R217
330K
R225
22K
R229
100K
R230
10K
R231
100K
R201
10K
R202
47K
R203
220
R204
3.3K
R205
6.8K
R206
22K
C201
0.01
C202
100P
C205
0.1
C210
0.01
C211
0.47
C212
0.01
C220
0.22
C221
0.22
C203
4V15
C204
0.1
S201
(VOLUME+)
S202
(VOLUME-)
S203
S204
PLAY
2 µs. 1V/DIV.
0.2ms. 1V/DIV.
F=6MHz
2.3V
P-P
1.1V
P-P
2.4V
2.4V
1.5V

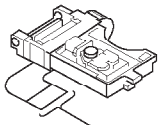

:POSITIVE VOLTAGE LINE
:PLAYBACK SIGNAL LINE
R318 1M
R507 4.7K
Q501
C510 0.033
C507 2.5V150
Q501,502 2SK2731T146 MUTING
R503 12
TP74,101
L501
C511 0.22
R505 820
Q504 UMG2NTR MUTING CONT./ GAIN CONT.
R502 47K
C513 0.033
C508 2.5V150
Q502
R508 4.7K
R501 47K
TP75,100
L502
C512 0.22
JK501 HEADPHONES 14 Ω (φ3.5)
C501 4V15
Q505
IC501 NJU7082BVTE1 HEADPHONES AMP
R513 15K
C505 330P
TP77,105
TP76,106
R517 10K
TP78,103
TP102
C502 0.1
Q506
Q505,506 2SK2731T146 GAIN
Q503 2SB1295-6-TB POWER SUPPLY
C506 330P
R514 15K
R509 4.7K
C509 2.5V22
L201
TP3, TP305
D402 RB081L20TE25
L402
Z401
BATTERY CASE
BATTERY 1.5V LR6(UM-3)
C404 6.3V47
IC402 XC6368A241MR DC-DC CONVERTER
C403 3300P
R401 2.2M
C401 4V220
R404 270K
C410 01
R405 1M
Q406 2SB1218ASTX POWER SUPPLY
TP80,108, 302,304
RECHARGEABLE BATTERY 1.2V
IC102 MNA7400CWA1T 16M DRAM
Q202 2SB1295-6-TB SWITCHING(REMOTE)
Q401 XP161A1355PR SWITCHING
RX901 10K
Q201 2SD1819ASTX SWITCHING(REMOTE)
R219 10K
C206 100P
R218 27K
R207 470
C126 01
C109 01
TP7,11
TP79,107, 301,303
2.4V
1.5V

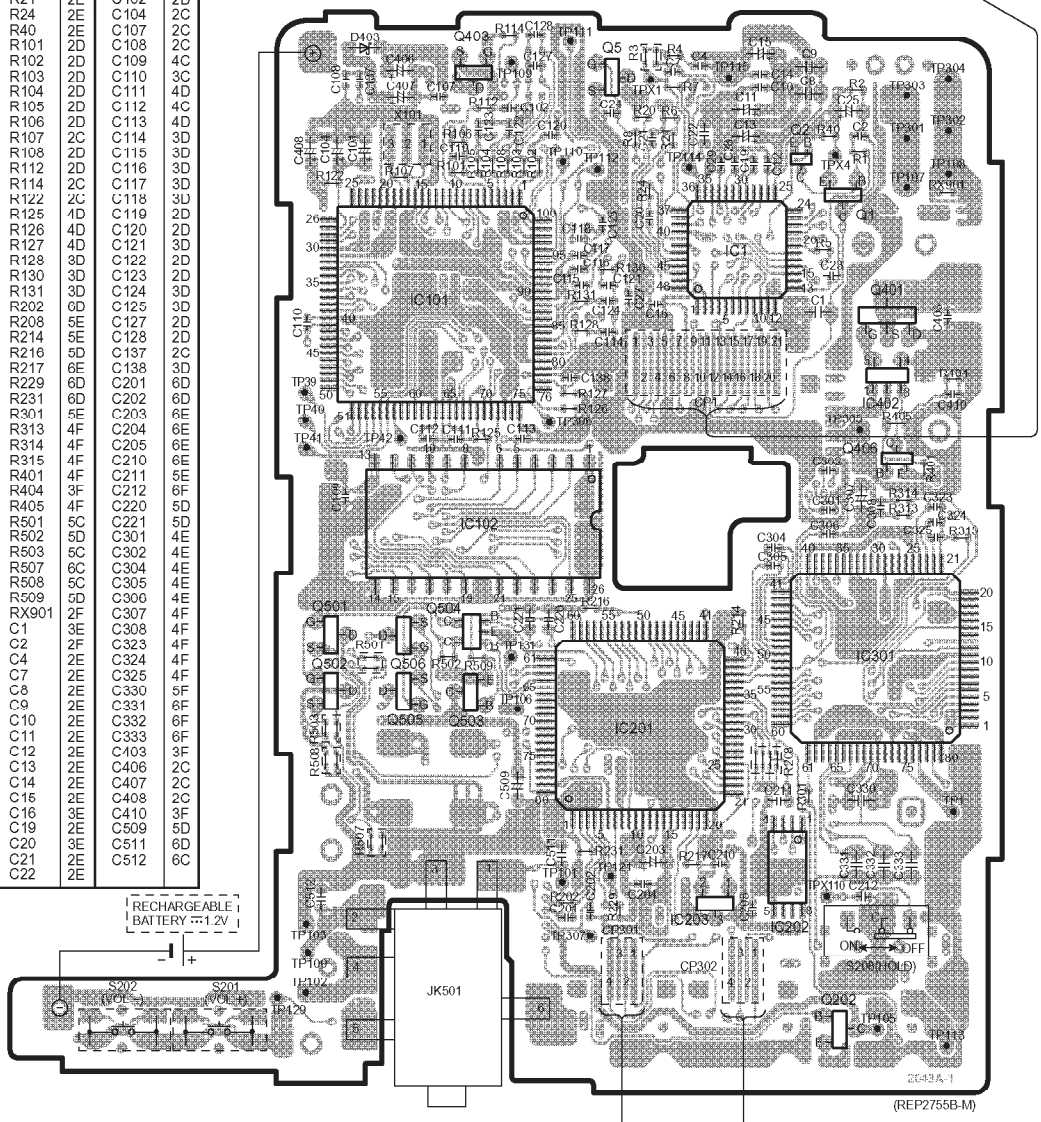
■ELECTRICAL PARTS LOCATION

Ref No.	Lo No.	Ref No.	Lo No.	Ref No.	Lo No.
IC1	3E	R3	2E	C23	3E
IC101	3C	R4	2E	C24	2D
IC102	4D	R5	3E	C25	2F
IC201	5D	R6	2E	C27	3D
IC202	6E	R7	2E	C28	2E
IC203	6E	R8	2D	C29	2E
IC301	5F	R20	2E	C101	2C
IC402	3F	R21	2E	C102	2D
Q1	2F	R24	2E	C104	2C
Q2	2E	R40	2E	C107	2C
Q5	2D	R101	2D	C108	2C
Q202	7E	R102	2D	C109	4C
Q401	3F	R103	2D	C110	3C
Q403	2D	R104	2D	C111	4D
Q406	4F	R105	2D	C112	4C
Q501	5C	R106	2D	C113	4D
Q502	5C	R107	2C	C114	3D
Q503	5D	R108	2D	C115	3D
Q504	5D	R112	2D	C116	3D
Q505	5C	R114	2C	C117	3D
Q506	5C	R122	2C	C118	3D
D403	2C	R125	4D	C119	2D
X101	2C	R126	4D	C120	2D
S201	7B	R127	4D	C121	3D
S202	7B	R128	3D	C122	2D
S208	6F	R130	3D	C123	2D
CP1	3E	R131	3D	C124	3D
CP301	6D	R202	6D	C125	3D
CP302	6E	R208	5E	C127	2D
JK501	6D	R214	5E	C128	2D
TP1	6F	R216	5D	C137	2C
TP39	4C	R217	6E	C138	3D
TP40	4C	R229	6D	C201	6D
TP41	4C	R231	6D	C202	6D
TP42	4C	R301	5E	C203	6E
TP100	6C	R313	4F	C204	6E
TP101	6D	R314	4F	C205	6E
TP102	6C	R315	4F	C210	6E
TP103	6C	R401	4F	C211	5E
TP105	7F	R404	3F	C212	6F
TP106	5D	R405	4F	C220	5D
TP107	2F	R501	5C	C221	5D
TP108	2F	R502	5D	C301	4E
TP109	2D	R503	5C	C302	4E
TP110	2D	R507	6C	C304	4E
TP111	2D	R508	5C	C305	4E
TP112	2D	R509	5D	C306	4E
TP113	7F	RX901	2F	C307	4F
TP114	2E	C1	3E	C308	4F
TP115	2E	C2	2F	C323	4F
TP121	6D	C4	2E	C324	4F
TP129	6C	C7	2E	C325	4F
TP131	5D	C8	2E	C330	5F
TP301	2F	C9	2E	C331	6F
TP302	2F	C10	2E	C332	6F
TP303	2F	C11	2E	C333	6F
TP304	2F	C12	2E	C403	3F
TP305	4F	C13	2E	C406	2C
TP306	4D	C14	2E	C407	2C
TP307	6D	C15	2E	C408	2C
TPX1	2E	C16	3E	C410	3F
TPX4	2F	C19	2E	C509	5D
TPX110	6E	C20	3E	C511	6D
R1	2F	C21	2E	C512	6C
R2	2F	C22	2E		

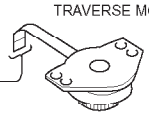
(SIDE: A)

MD OPTICAL PICKUP

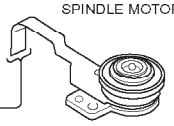




TRAVERSE MOTOR

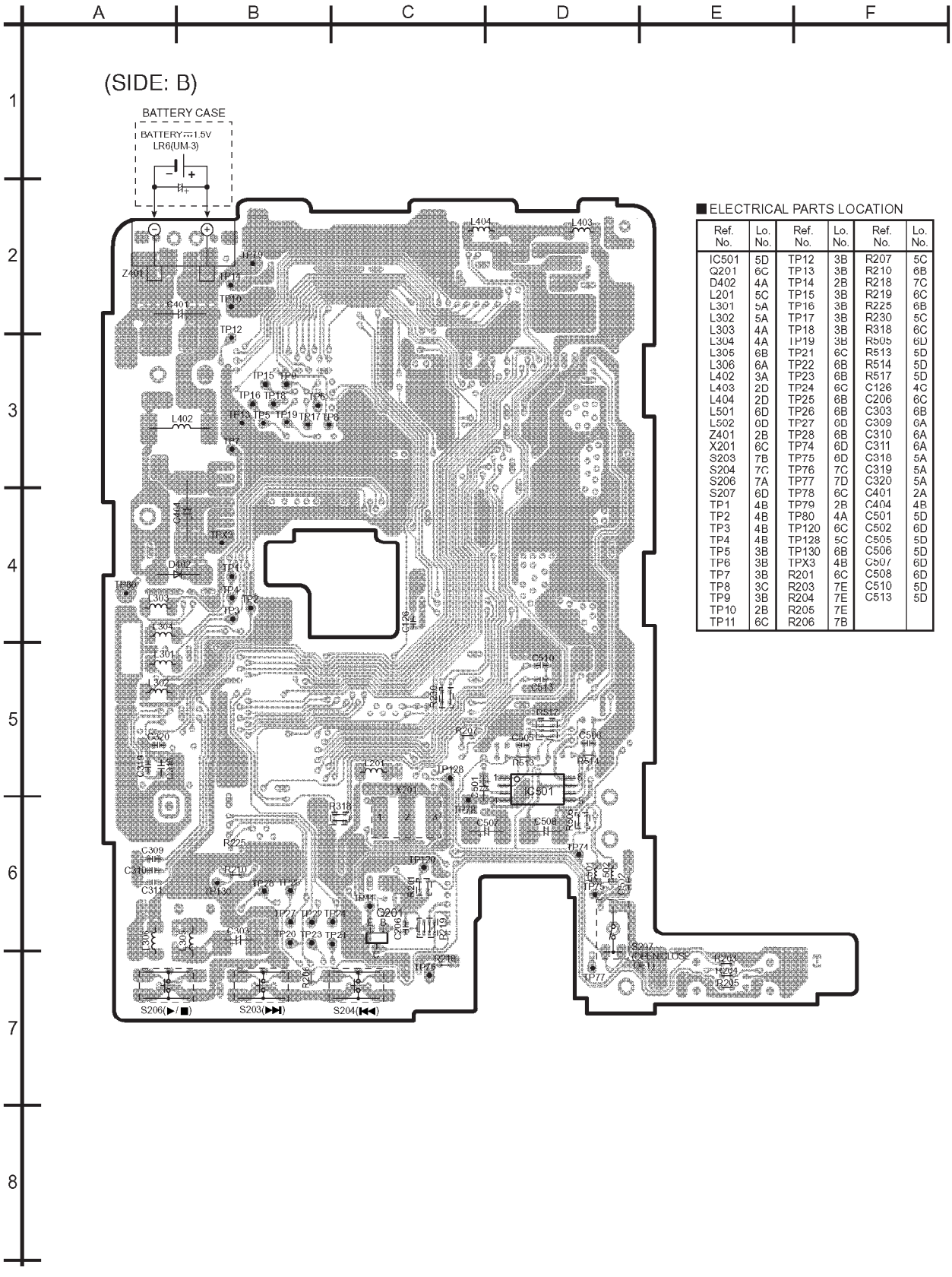


SPINDLE MOTOR



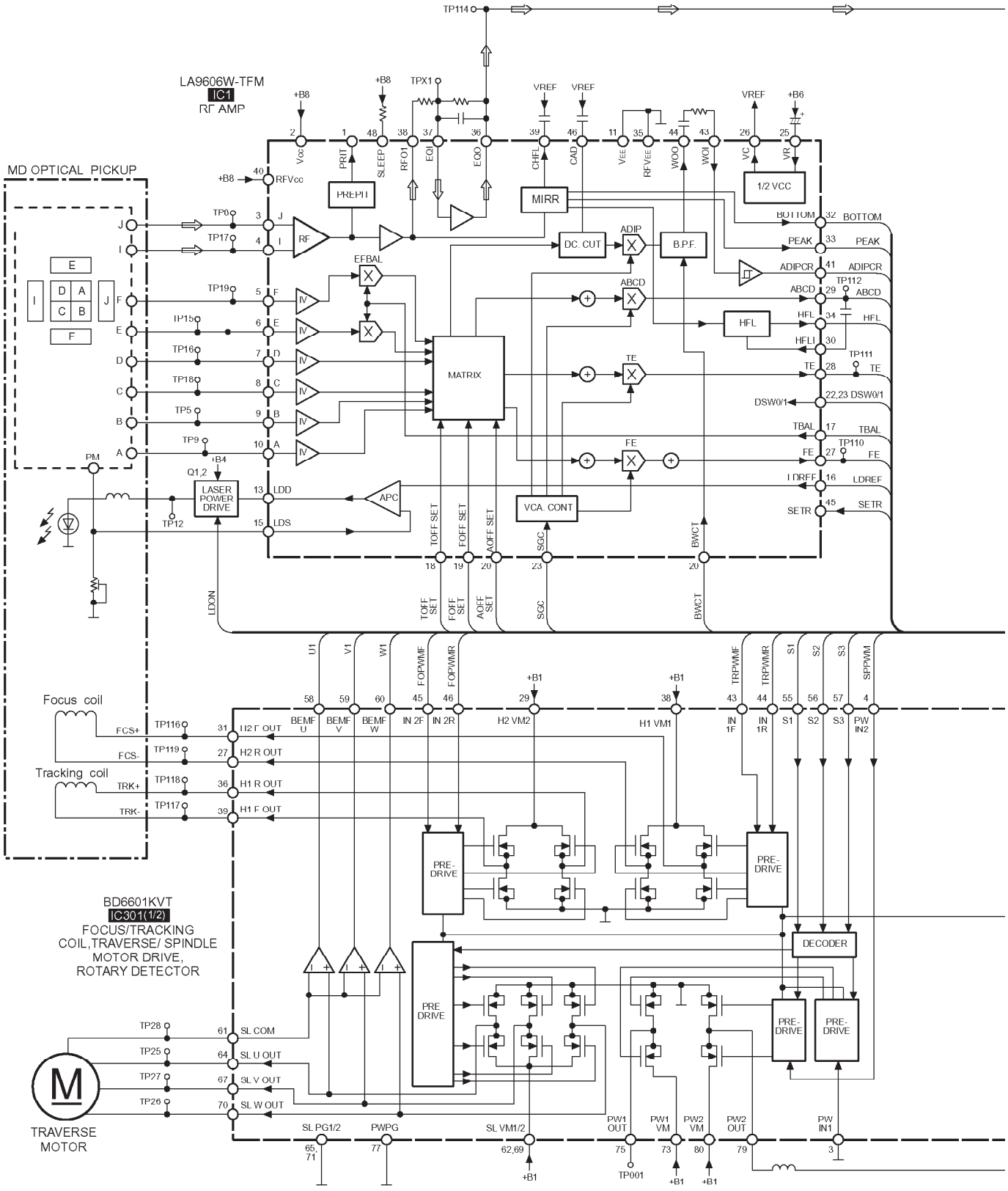
Note: This printed circuit board diagram may be modified at any time with the development of new technology.

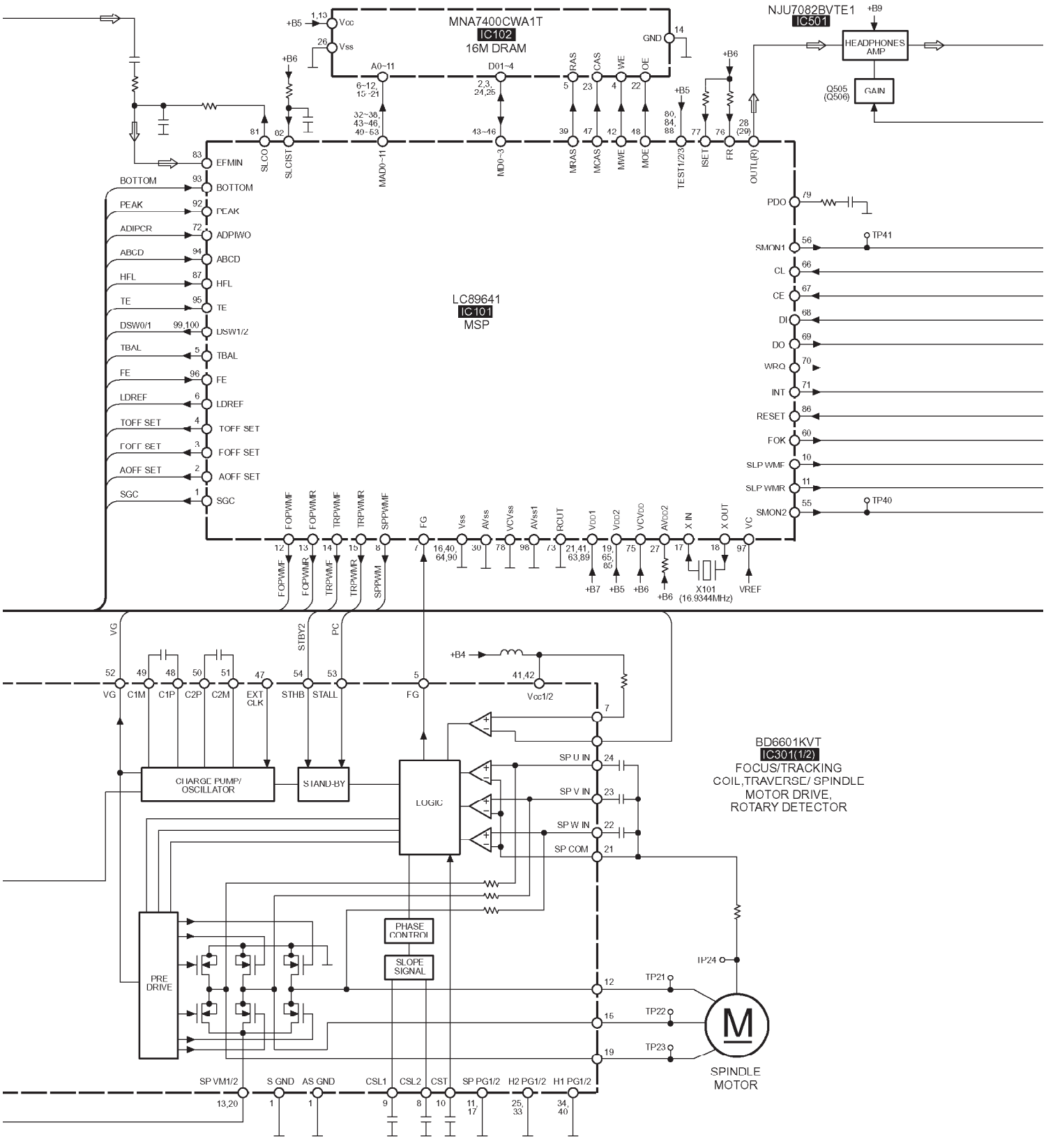
(SIDE: B)

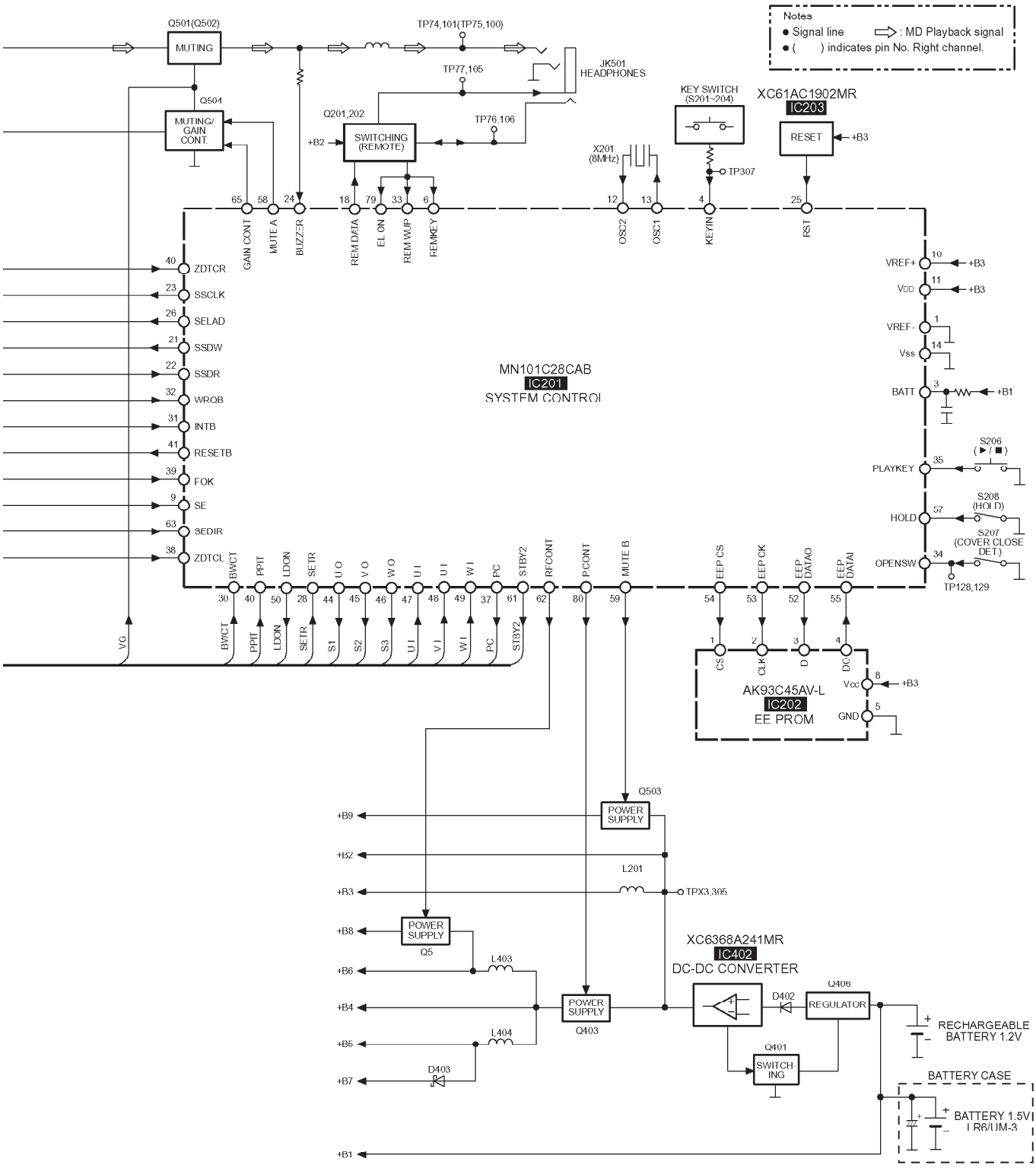


■ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
IC501	5D	TP12	3B	R207	5C
Q201	6C	TP13	3B	R210	6B
D402	4A	TP14	2B	R218	7C
L201	5C	TP15	3B	R219	6C
L301	5A	TP16	3B	R225	6B
L302	5A	TP17	3B	R230	5C
L303	4A	TP18	3B	R318	6C
L304	4A	TP19	3B	R505	6D
L305	6B	TP21	6C	R513	5D
L306	6A	TP22	6B	R514	5D
L402	3A	TP23	6B	R517	5D
L403	2D	TP24	6C	C126	4C
L404	2D	TP25	6B	C206	6C
L501	6D	TP26	6B	C303	6B
L502	6D	TP27	6D	C309	6A
Z401	2B	TP28	6B	C310	6A
X201	6C	TP74	6D	C311	6A
S203	7B	TP75	6D	C318	5A
S204	7C	TP76	7C	C319	5A
S206	7A	TP77	7D	C320	5A
S207	6D	TP78	6C	C401	2A
TP1	4B	TP79	2B	C404	4B
TP2	4B	TP80	4A	C501	5D
TP3	4B	TP120	6C	C502	6D
TP4	4B	TP128	5C	C505	5D
TP5	3B	TP130	6B	C506	5D
TP6	3B	TPX3	4B	C507	6D
TP7	3B	R201	6C	C508	6D
TP8	3C	R203	7E	C510	5D
TP9	3B	R204	7E	C513	5D
TP10	2B	R205	7E		
TP11	6C	R206	7B		


LA9606W-TFM
IC1
RF AMP
MD OPTICAL PICKUP
BD6601KVT
IC301(1/2)
FOCUS/TRACKING
COIL,TRAVERSE/ SPINDLE
MOTOR DRIVE,
ROTARY DETECTOR
TRAVERSE
MOTOR
Focus coil
Tracking coil
MATRIX
RF
DC. CUT
B.P.F.
MIRR
1/2 VCC
HFL
VCA. CONT
LASER
POWER
DRIVE
APC
PRE-
DRIVE
DECODER
TP114
TPX1
+B8
+B6
+B4
+B1
VREF
BOTTOM
PEAK
ADIPCR
ABCD
HFL
HFLI
TE
DSW0/1
TBAL
FE
LDREF
SETR
TOFF SET
FOFF SET
AOFF SET
SGC
BWCT
LDON
FCS+
FCS-
TRK+
TRK-
SL COM
SL U OUT
SL V OUT
SL W OUT
SL PG1/2
PWPG
SL VM1/2
PW1 OUT
PW1 VM
PW2 VM
PW2 OUT
PW IN1
TP001


MNA7400CWA1T
IC102
16M DRAM
NJU7082BVTE1
IC501
HEADPHONES AMP
GAIN
LC89641
IC101
MSP
BD6601KVT
IC301(1/2)
FOCUS/TRACKING
COIL,TRAVERSE/ SPINDLE
MOTOR DRIVE,
ROTARY DETECTOR
CHARGE PUMP/ OSCILLATOR
STAND-BY
LOGIC
PRE DRIVE
PHASE CONTROL
SLOPE SIGNAL
SPINDLE MOTOR
X101 (16.9344MHz)


Notes
● Signal line ⇨ : MD Playback signal
● ( ) indicates pin No. Right channel.
Q501(Q502)
MUTING
TP74,101(TP75,100)
JK501
HEADPHONES
TP77,105
Q504
MUTING/
GAIN
CONT.
Q201,202
+B2
SWITCHING
(REMOTE)
TP76,106
KEY SWITCH
(S201~204)
XC61AC1902MR
IC203
RESET
+B3
X201
(8MHz)
TP307
MN101C28CAB
IC201
SYSTEM CONTROL
ZDTCR
SSCLK
SELAD
SSDW
SSDR
WRQB
INTB
RESETB
FOK
SE
SEDIR
ZDTCL
GAIN CONT
MUTE A
BUZZER
REM DATA
EL ON
REM WUP
REMKEY
OSC2
OSC1
KEYIN
RST
VREF+
VDD
VREF-
Vss
BATT
+B1
PLAYKEY
S206
HOLD
S208
(HOLD)
OPENSW
S207
(COVER CLOSE
DET.)
TP128,129
BWCT
PPIT
LDON
SETR
U O
V O
W O
U I
V I
W I
PC
STBY2
RFCONT
PCONT
MUTE B
EEP CS
EEP CK
EEP
DATAO
EEP
DATAI
VG
S1
S2
S3
AK93C45AV-L
IC202
EE PROM
Vcc
GND
Q503
POWER
SUPPLY
+B9
+B2
+B3
L201
TPX3,305
+B8
POWER
SUPPLY
Q5
+B6
L403
+B4
POWER
SUPPLY
Q403
+B5
L404
+B7
D403
XC6368A241MR
IC402
DC-DC CONVERTER
D402
Q406
REGULATOR
Q401
SWITCH-
ING
RECHARGEABLE
BATTERY 1.2V
BATTERY CASE
BATTERY 1.5V
(R6/UM-3)
+B1

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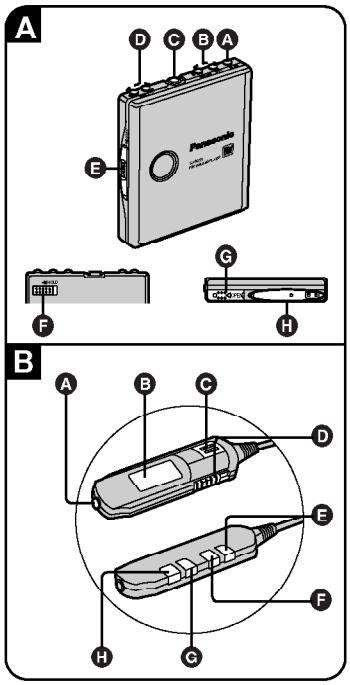
Supplied Accessories

Check the packing carton for these accessories.

Stereo earphones with cord clip (RFEV325P-SA) . . . . . 1 pc.
Wired remote control (RFEV020P-SM) . . . . . 1 pc.
External battery case (RFA1136-H) . . . 1 pc.
Rechargeable Ni-Cd battery with battery carrying case (RP-BP62EY-S1) . . . . . 1 pc.
Remove the rechargeable battery from their case before use.
Charger . . . . . 1 pc.
For Continental Europe (RP-BC155AEYB)
For UK (RP-BC155AEBY)
Carrying case (RFC0045-K) . . . . . 1 pc.
(Use numbers indicated when asking for replacement parts.)



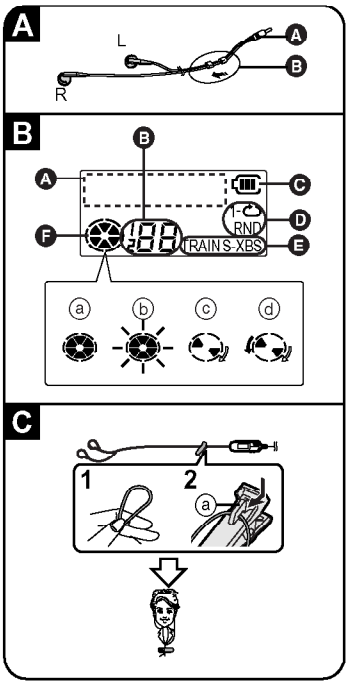
Location of controls

Main unit A

- **A** Play/stop button (▶/■)
- **B** Skip/search buttons (|◀◀, ▶▶|)
- **C** Earphone jack (∩)
- **D** Volume buttons (−, VOL, +)
- **E** Open switch (◀ OPEN)
- **F** Hold switch (HOLD)
- **G** Rechargeable battery compartment
- **H** Terminal for battery case

Wired remote control B

- **A** Earphone jack
- **B** Display
- **C** Play/stop button
- **D** Function selector/hold switch (MAIN, SUB, HOLD)
- **E** Volume control/tone control button (VOL, +/EQ)
- **F** Volume control/play mode button (VOL, −/PLAY MODE)
- **G** Skip/search (forward)/light/display button (▶▶| / • LIGHT, ▬ DISP)
- **H** Skip/search (backward) button (|◀◀)



Location of controls

Stereo earphones A

- **A** Plug
- **B** Slider
  Slide up to prevent tangling the cord when the earphones are not in use.

Display information B

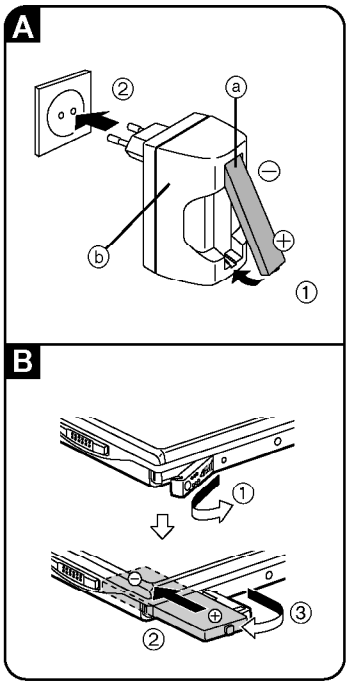
- **A** Text/play time
- **B** Number of tracks/track number
- **C** Battery indication
- **D** Play mode
- **E** Sound quality
- **F** Operation indicator
  - ⓐ **Stopped:** Fully lights
  - ⓑ **Reading TOC:** Flashes
  - ⓒ **Playing:** Rotates slowly
  - ⓓ **Skip/Search**
    backward:
    Rotates anticlockwise quickly
    forward:
    Rotates clockwise quickly

Attaching the cord clip C

1. **Loosely loop the earphone cord.**
2. **Fit it firmly into the clip's holder.**
   ⓐ Holder

Use the clip to keep the cord from tangling.

> Do not slide the clip up and down the cord as this may damage the cord.



Power source

The rechargeable battery

1. **Recharge the battery. A**
   - The battery needs to be recharged before using it for the first time.
   - Use only the included charger when recharging.
   - ⓐ Rechargeable Ni-Cd battery (included)
   - ⓑ Charger (included)

   Note
   For UK, the shape of the cahrger is different.
2. **After the battery has charged, remove it from the charger and insert into the player. B**

■ Recharging and playback times

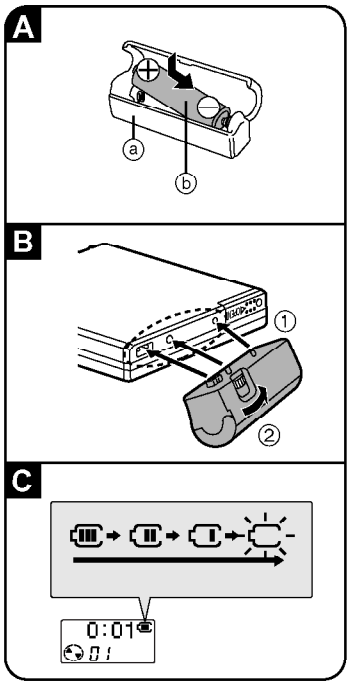
Charging time: Approx 2 hours
Play time: Approx 7 hours
Playback time may be reduced under some conditions.

■ Rechargeable number of times

About 300
The battery has reached the end of its useful life if play time dramatically reduces after recharging.

■ Replacement

Rechargeable Ni-Cd battery
(RP-BP62EYS1)



Power source

Dry cell battery

1. **Insert the battery into the battery case. A**
   - ⓐ External Battery case (included)
   - ⓑ One LR6, AA, UM-3 battery (not included)
2. **Attach the case to the player and fix in place with the screw. B**

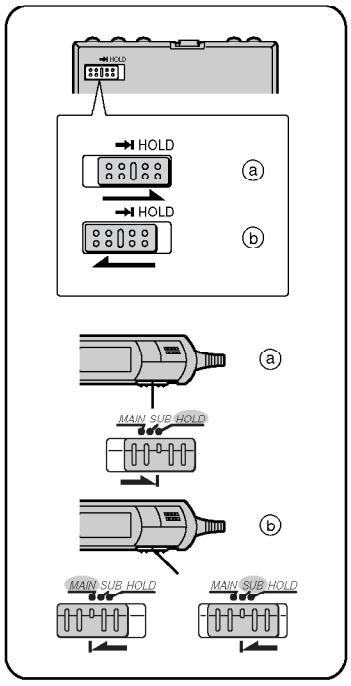
■ The battery indicator C

The illustration shows how the indicator on the remote control display appears as the battery's power runs down.

When the battery indicator begins to flash, the battery is almost flat and should be replaced or recharged.

■ For longer playback

- You can get about 32 hours of playback if the two types of batteries are used together.
- We recommend using long-life Panasonic alkaline batteries.



The HOLD function

This function stops the player and remote control from responding when a button is pressed.
ⓐ Hold mode
ⓑ Release

Guards against the following

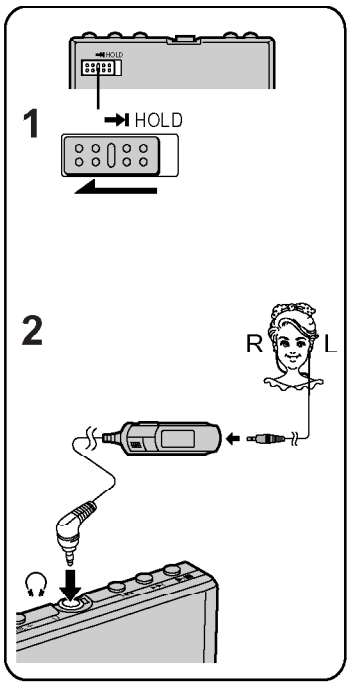
- The unit is powered on accidentally when not in use, causing the batteries to run down.
- A button is accidentally pressed during play, interrupting playback.

Note
There is a HOLD switch on both the player and remote control, each of which works independently of the other.

■ The "HOLD" display

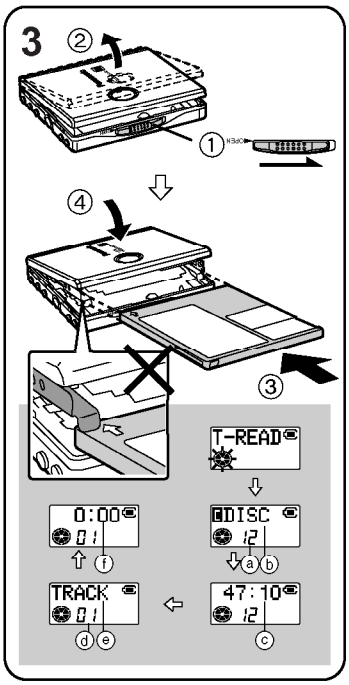
This is displayed for about 2 seconds on the remote control's display panel when the following occurs.

- The main unit is on hold and a button is pressed. (If off, display appears only if [▶/■] is pressed.)
- The remote control's switch is moved to hold. The display also lights for about 5 seconds at this time.



Playback (Basic Play)

1. **Release the hold function.**
2. **Connect the remote control and earphones, then insert the remote control's plug into the earphone jack (🎧) on the player.**



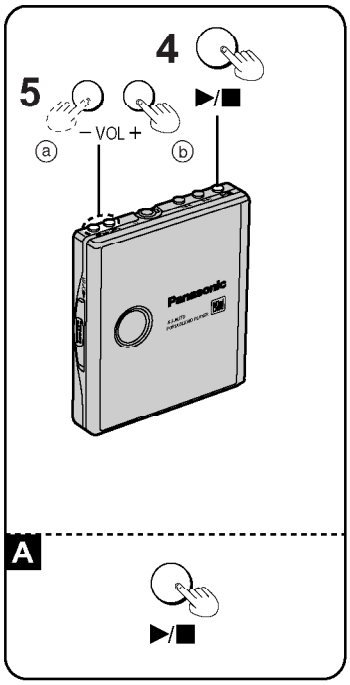
Playback (Basic Play)

3. Open the player and insert an MD.

① Slide to the right.
② Open the lid.
③ Insert disc with label facing upward, **push the disc in the center until it locks in place.**
④ Close the lid.

After an MD has been inserted the player turns on, reads the information from it, then, after a few seconds, the power goes off again. (The remote control's display lights for about 5 seconds after a disc is inserted.) The name of the disc or song is shown on the display. The information scrolls from right to left across the display if it can not be displayed all at once.
(If this information has not been entered onto the disc, then "-♪♪♪-" is shown instead.)

ⓐ Total number of tracks
ⓑ Disk name
ⓒ Total playing time
ⓓ Track number
ⓔ Track name
ⓕ Elapsed playing time of each track



Playback (Basic Play)

4. Press [▶/■].
"PLAY" is displayed.
The player stops automatically when all the tracks on the disc have been played.

5. Adjust the volume.
ⓐ To decrease the volume level
ⓑ To increase the volume level
Volume level is 0–25.

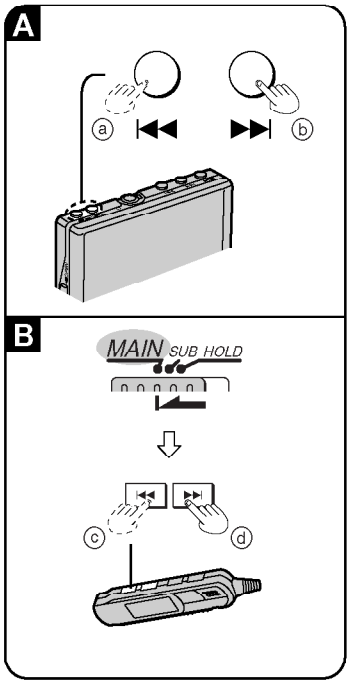
To stop the disc A
Press [▶/■].
"STOP" is displayed.
The unit powers itself off automatically in about 10 seconds.

■ Resume function

The player stores the point at which play was stopped and if [▶/■] on the main unit or the play/stop button on the remote control is pressed again, play begins from that point. This does not work if the player is opened or if the battery is removed. The player starts play from the first track in these cases.

■ Monaural playback function

If a disc was recorded monaurally, the unit automatically switches to monaural playback mode.



Other functions

Skip

This function skips tracks and play begins from the beginning of the selected track.

Main unit A

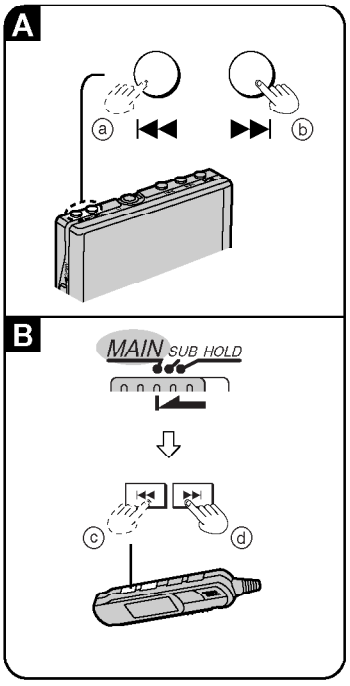
Press during play.
ⓐ Backward
ⓑ Forward

Remote Control B

Preparation: Set the selector to **MAIN**.

Press during play.
ⓒ Backward
ⓓ Forward

For your reference:
You can skip more than one track by repeating this operation. The first skip backwards takes you to the beginning of the current track. Pressing the button in quick succession takes you back to previous tracks.



Other functions

Search

This function allows you to fast-forward or rewind through tracks.

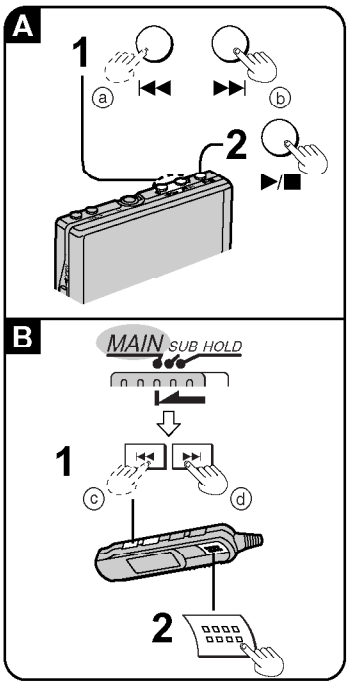
Main unit A

Hold down during play.
ⓐ Backward
ⓑ Forward

Remote Control B

Preparation: Set the selector to **MAIN**.
Hold down during play.
ⓒ Backward
ⓓ Forward

For your reference:
- You cannot fast-forward past the end of the last track. If you release the button at this point, the player stops.
- You cannot rewind beyond the beginning of the first track. The player starts playing the first track if the button is released at this point.



Other functions

Track select

This function allows you to begin listening from a selected track.

Main unit A

1. **Select a track by pressing while stopped.**
   - ⓐ Backward
   - ⓑ Forward
2. **Press [▶/■].**

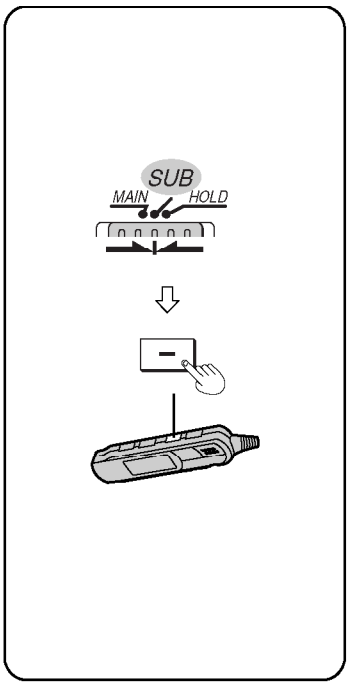
Remote Control B

Preparation: Set the selector to **MAIN**.

1. **Select a track by pressing while stopped.**
   - ⓒ Backward
   - ⓓ Forward
2. **Press the play/stop button.**

For your reference:

- You can hold the switch or button in place to go through the tracks.
- If [|◀◀] is pressed while the first track is selected then the last track is selected.
- If [▶▶|] is pressed while the last track is selected then the first track is selected.



Other functions

Repeat and random play

Remote Control function

Preparation: Set the selector to **SUB**.

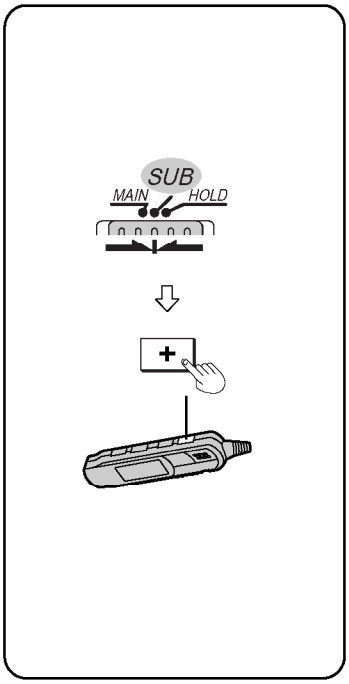
Press [−] when the player is stopped or playing.
Every time the button is pressed the mode changes and an indicator is shown on the display in the following order.

1 track repeat (1- ↻)
One track is played over and over.
↓
All track repeat (↻)
All tracks on the disc are repeated.
↓
Random (RND)
All tracks are played randomly once each then the player stops automatically.
↓
Normal (no indicator is shown)

Note
If you have selected the mode when the player was stopped, press the play/stop button.

For your reference:

- When the player is in the all-track repeat mode, you can skip and search beyond the first and last track.
- You cannot skip or search back to a track that has already been played when in the random mode.
- Reset after changing discs.



Other functions

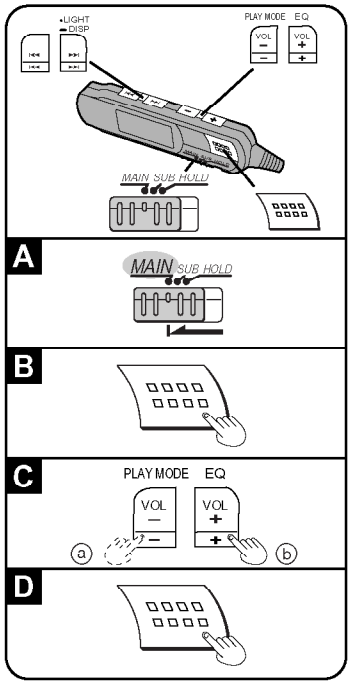
Sound quality

Remote Control function

Preparation: Set the selector to **SUB**.
There are three sound quality modes to choose from.

Press [+] when the player is stopped or playing.
Every time the button is pressed the mode changes and an indicator is shown on the display in the following order.

S-XBS
Increases the power of the bass sounds.
↓
TRAIN
Reduces sounds that may annoy others when you are using the player in a public place.
↓
Normal (no indicator is shown)



About the remote control

Basic operation

Preparation:
Set the selector to **MAIN** to release the hold mode. **A**
(The remote control can be operated regardless of the hold mode of the unit.)

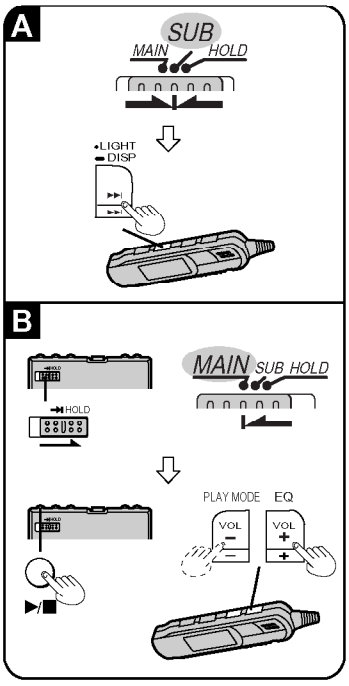
To start playback B
Press once during off.
"PLAY" is displayed.

To adjust the volume C
ⓐ To decrease the volume level
ⓑ To increase the volume level
Volume level is 0–25.

To stop the disc D
Press once during play.
"STOP" is displayed.

Note
If the display on the remote control disappears or seems unusual, disconnect the remote control then plug it in again firmly.

[Refer to "Other functions" for other operations.]



About the remote control

The display

The display lights for about 5 seconds when an operation is done on the unit or remote control. It remains lit for up to 20 seconds while a track or disc name is scrolling on the screen.

■ Checking the display A

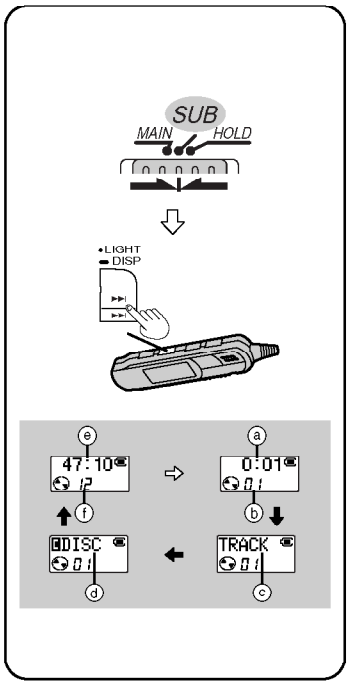
Preparation: Set the selector to **SUB**.

Press [▶▶|/• LIGHT, ⬬ DISP].
The display lights for 5 seconds.

■ Adjusting the display's contrast B

Preparation:
1. Start playback.
2. Put the main unit in hold.
3. Slide the selector to **MAIN**.

Press and hold [▶/■] on the main unit and press [ı] or [ ] on the remote control to adjust the contrast.
+: darker, −: lighter



About the remote control

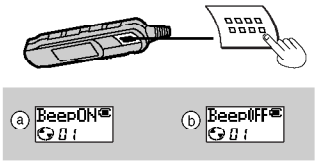
■ Changing the remote control's display

Preparation: Set the selector to **SUB**.

Press and hold [▶▶|/•LIGHT, ⬬ DISP].
ⓐ Elapsed time of the current track
ⓑ Track number in play
ⓒ Name of the track
ⓓ Name of the disc
ⓔ Total playing time
ⓕ Total number of tracks

◗: Changes each time the button is pressed.
◊: Changes automatically after a few seconds.

("-♪♪-" is displayed when the disc contains no track or disc names.)



About the remote control

The operation tone

A tone sounds when a button on the remote control is pressed.

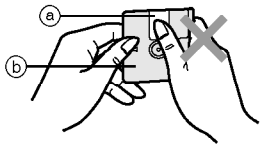
Skip
forward: Beep Beep
backward: Beep Beep Beep
other functions: Beep

The tone can be turend on and off.

ⓐ **To turn on:**
Press and hold the play/stop button until "Beep ON" appears.

ⓑ **To turn off:**
Press and hold the play/stop button until "Beep OFF" appears.

Note
If the above is done during play, play stops and power automatically goes off in about ten seconds.



MD's

■ To maintain the best quality sound

Take care with storage
Do not place the disc in the following places:
- Places where it is exposed to direct sunlight, or extremely hot places like cars
- Humid places like bathrooms
- Sandy or dusty locations

Leave the shutter closed.
If the shutter is accidentally opened, close it again as quickly as possible. Do not touch the disc inside.
ⓐ Shutter

Disc care
Wipe with a soft, dry cloth if the cartridge gathers dust.
ⓑ Cartridge

What the displays mean

Display	Meaning
BLANK	Nothing is recorded on the disc currently loaded.
HOLD	Hold is on.
NoDISC	There is no disc in the unit.
T-READ	Reading TOC
ERROR	A problem has occurred while the unit was reading TOC, or during play.

TOC: Table of contents
Information about the position, division, and order of tracks on the disc.

Maintenance

■ Main unit

Wipe the main unit with a soft, dry cloth.
If the player becomes particularly dirty, use a cloth dipped in a mild detergent solution and then wipe dry.
- Do not use alcohol or thinners to clean the player.
- Before using chemically treated cloths, read their instructions carefully.

Cautions

■ The main unit

Avoid the following as they may damage the unit.
- Dropping and other strong impacts
- Rain
- High humidity areas such as bathrooms
- Dusty areas such as warehouses
- High temperatures such as near heating appliances
- This unit is resistant to the effects of vibration but sound may skip if the vibration is constant.

■ The earphones

Leave a reasonable amount of slack in the cord if you wind it around the main unit.

■ The rechargeable battery

- Do not peel off the plastic covering on the rechargeable battery.
- The battery may not last as long as usual after recharging if it has not been used for a long period. After a number of uses it will return to normal.
- The battery may heat up while charging but this is normal.
- Do not attempt to recharge the battery for over twelve hours. Overcharging reduces the life of the battery.
- The charger can cause interference to radio reception so do not recharge the battery near a radio in use.

Notice about the rechargeable battery
The battery is designated recyclable.
Please follow your local recycling regulations.

Cautions

■ Dry cell batteries/rechargeable batteries

- Insert the batteries in the correct polarities to avoid leakage and damage to this unit.
- Remove all the batteries if the set will not be used for a long period of time.

■ Precautions for Listening with the Headphones or Earphones

- Do not play your headphones or earphones at a high volume. Hearing experts advise against continuous extended play.
- If you experience a ringing in your ears, reduce volume or discontinue use.
- Do not use while operating a motorized vehicle. It may create a traffic hazard and is illegal in many areas.
- You should use extreme caution or temporarily discontinue use in potentially hazardous situations.
- Even if your headphones or earphones is an open-air type designed to let you hear outside sounds, don't turn up the volume so high that you can't hear what's around you.

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CAUTION!

THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.
DO NOT OPEN COVERS AND DO NOT REPAIR YOURSELF. REFER SERVICING TO QUALIFIED PERSONNEL.

WARNING:

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK OR PRODUCT DAMAGE, DO NOT EXPOSE THIS APPLIANCE TO RAIN, SPLASHING, DRIPPING OR MOISTURE.

Marking sign is located on bottom of the unit.

Troubleshooting guide

Before requesting service for this unit, check the chart below for a possible cause of the problem you are experiencing. Some simple checks or a minor adjustment on your part may eliminate the problem and restore proper operation.
If you are in doubt about some of the check points, or if the remedies indicated in the chart do not solve the problem, refer to the directory of Authorized Service Centers (enclosed with this unit) to locate a convenient service center, or consult your dealer for instructions.

Problem	Check this
Player doesn't operate at all.	• Is the hold function on? • Is there a disc loaded? • Have the batteries run down? • Has condensation formed on the disc or lens? (Wait an hour before use.)
No sound from the earphones. No response from the remote control.	• Has the volume been turned down too far? • Have the plugs on the earphone and remote control been inserted correctly? (Try plugging it in again.) • Are the plugs dirty?
The player doesn't play in order from the first track.	• Has the play mode been switched to RANDOM? • Did you stop the disc part way through the last time listened to it?
Noise	Are you using the player near a strong magnet, such as may be found in a television?